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8 July 1985

USSR Report

LIFE SCIENCES

BIOMEDICAL AND BEHAVIORAL SCIENCES

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AEROSPACE MEDICINE

COSMONAUT-PHYSICIAN O. AT'KOV MEMBER OF SALYUT-7 CREW

Moscow MEDITSINSKAYA GAZETA in Russian 12 Apr 85 p 3

FAYBISHENKO, Yu., interviewer

[Abstract] The article is an interview with Oleg At'kov, who comments in general on his work during the 237-day mission on the orbiting scientific station "Salyut-7" with Leonid Kizim and Vladimir Solov'yev. The interviewer notes that before the mission, space program officials were a little concerned about possible psychological problems that could develop from having a crew of three for the first time on a prolonged mission, such as a two-against-one dispute. Asked about this, At'kov replied that no such difficulty arose, saying that it was precluded by the understanding of all crew members that they were doing very serious work whose results depended in large measure on their working relationships. Pressed on whether there really weren't any kinds of problems, At'kov replied:

"These were purely instances connected with the work at hand. If such a situation arose between two [of us], we would not appeal to the third member and would work out the problem independently. The third member, if he could, would try to find a compromise solution. And everything always worked out in the interests of the matter."

Commenting on the work of Kizim and Solov'yev outside the spacecraft, At'kov noted that in working as long as four hours their pulses would stay as high as 120-140 beats per minute.

FTD/SNAP
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SYSTEM PLANNING OF AGRICULTURAL CHEMICALIZATION IN AN AGROCHEMICAL SUBCOMPLEX SYSTEM

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 1, 85 pp 48-51

[Article by Candidate of Economic Sciences V. M. Gabidullin and Candidate of Economic Sciences A. D. Dul'man]

[Text] The inter-industrial sector nature, the great national economic importance, the necessity for a thorough scientific development of basic directions, the optimization of the level and increase in the use of chemicals in agriculture have all contributed to the development of a target long-term comprehensive subprogram of chemicalization for the country. This subprogram is a component part of a comprehensive target subprogram of chemicalization for the entire national economy (TsKP-khimizatsii). Naturally, a long-term comprehensive target program for the development of industries within the agro-chemical subcomplex (APK) is being worked out simultaneously. The planned stages for the subprogram's development are the following: First stage -- up to the year 1990, the second stage -- 1991 - 2000, and the third stage -- beyond the year 2000.

Problems concerned with the production and use of chemicals are being examined and resolved in the subpropgram on par with the scale of the entire agro-industrial complex. Like any other program of its kind, this subprogram represents a complex of socioeconomic, agro-economic, industrial, scientific-research, organizational-managerial, and other assignments and measures that are interrelated with respect to resources, the personnel who execute the assigned tasks, and the dates of their implementation. The basic goal of chemicalization is to increase

national economic efficiency of agriculture and the entire agro-industrial complex. This means that we must achieve a growth in the volume of livestock and plant production, an improvement in product quality, and the prevention of losses through the scientifically substantiated use of mineral fertilizers, pesticides, chemical forage additives, forage preservatives, polymers, and a number of other types of chemical products.

The subprogram is being developed along the following lines: The development of industry which produces chemicals for agriculture; the use of chemicals in farming and livestock breeding, land development, water management, and in food-producing sectors; the creation of a material-technical base for chemicalization.

Specific subtargets and tasks are being defined with respect to the actual directions taken in these efforts. For example, the goal of agricultural chemicalization is to increase harvest yields and other indices of harvest efficiency.

The following steps are essential to the achievement of the basic goal:

-- assure the fulfillment of the assignments of the USSR Food Program for the period up to 1990 that pertain to production, delivery, and increase efficiency of chemical agent utilization;

-- bring the future level of chemical agent deliveries and application to a point where, with greater efficient use of chemicals, the entire slated target agricultural output can be produced;

-- produce chemical agents (phosphorus, nitrogen, potassium, and other mineral fertilizers, chemical and biological agents for plant protection, etc.) in scientifically substantiated proportions;

-- formulate and realize the basic requirements which the chemical industry sectors must meet in order to improve the quality and variety of chemical agents. This would entail a consideration of scientific-technical development, particularly the broad introduction of advanced industrial technological methods for the cultivation of agricultural crops and animal

care.

-- achieve the accelerated development and rational operation of the material-technical base of chemicalization (warehouse complexes, special transportation machinery systems, etc.) as well as the introduction of advanced technology for the application of chemical agents which would not only markedly reduce losses of chemical products, but significantly increase the effectiveness of all chemicalization directions.

The comprehensive target program of agricultural chemicalization within the APK [agro-chemical subcomplex] is being developed in two versions. The first provides for fully satisfying the requirements for chemical products, based on the rational standards of food product consumption and the country's future economic development. The second version is based on the assigned resource limits (capital investments, mining and chemical raw materials, etc.).

Special attention in the subprogram is given to chemical agents for the introduction of advanced industrial processes of agricultural crop cultivation and animal care as well as for crop production on arid and irrigated lands.

An important factor in the subprogram is the justification for the amount of target products, target standards, and target indices. All of those factors are determined with consideration given to the specific features of the sectors and industries of the APK.

Thus, target products in agriculture are those produced with the use of chemical agents (grain, raw cotton, milk, meat, etc.). Target products in the sectors of the foodstuffs subcomplex are consumer products which are packaged, etc.

A target normative is the economically justified and quantitatively determined demand which is satisfied by the fulfillment of the program's basic goal (for example, the need for mineral fertilizers per hectare of plowed field, the need for chemical forage supplements per head of cattle, polymers per one ton of packing material, the neeed for supplements to agricultural products per one ton of chemical products, etc.).

The program's target indicator is the adjustment required by

resource limitations for any one particular planning period of the normative base. This explains the great importance acquired by the further improvement in the normative base and the use of advanced normatives for determining the APK sectors' requirements for chemical agents and their long-term economic effectiveness.

Special attention in the subprogram is given to the mutual link-up and justification for intra-industrial sector and inter-industrial sector proportions of chemicalization:

--between various chemical agents (the essential ratio between nitrogen, phosphorus, and potassium fertilizers; between the total volume of mineral fertilizers and pesticides, between chemical, biological, and microbiological agents for plant and animal protection;

-- between the rate at which deliveries of mineral fertilizers are increased and the expansion of soil liming, gypsum and phosphate applications;

-- between the development of fertilizer mixing and the production of a wide assortment of complex and mixed complex brands of fertilizers, including liquid and suspended complex fertilizers.

-- between the growth rate of chemical product deliveries and the increase in the production of agricultural products.

An independent area of the subprogram is the scientific development and justification of the material-technical base of agricultural chemicalization. This area is aimed at reducing losses of chemical agents during their transportation, storage, and use to natural wear and tear levels, and at an intensified increase in the effectiveness of chemicalization. These estimates are made with respect to all of the basic directions in the development of the material-technological base of chemicalization. This includes the creation of a highly productive special technology and transportation system, mechanized warehouses, machinery servicing stations, take-off and landing strips, etc.

The subprogram must define the demands placed by the consumer-industries upon the scientific institutions and sectors of the chemical industry in order to make new chemical agents and

to improve those agents that are being delivered. The ministries (departments), organizations, and other subdivisions of the APK are given specific assignments and a system of measures to be undertaken for the realization of those assignments. Those measures will indicate the personnel executing the assignments, the slated dates of completion, the size of expenditures, and the expected economic impact.

All of the tasks set by the subprogram constitute the further creative development of the basic directions of the national economy's chemicalization to which the Party has been devoting constant attention. During the last 20 years the deliveries of nitrogen fertilizers, herbicides, chemical forage supplements, forage preservatives, and polymer films to agriculture has been growing at a rapid pace. The quality of chemical agents that are being sent to agriculture has improved, and the variety of those agents has expanded. Thus, whereas the average concentration of substances in mineral fertilizers was 25.2 percent in 1965, in 1983 that figure was over 40 percent. The content of the active ingredients in forage phosphates has been brought up to 50 percent, and the amount of raw protein in forage yeasts has been increased to 60 percent. Deliveries of high-concentration and complex fertilizers have grown significantly.

The amount of mineral fertilizers made available to agriculture per one hectare of plowed field has grown by almost four times, and the amount of forage supplements per head of cattle has increased by 14 times. All of this has been enhanced by a significant increase in the level of agricultural chemicalization and an improvement in the structure of the agents being used.

As is known, in the past, because of mineral fertilizer shortcomings, they were used only for industrial crops, and primarily on irrigated lands. Now, the increment in fertilizer deliveries is directed primarily towards an increase in grain and forage. This was reflected by the structure of mineral fertilizer consumption. In 1983, 39 percent of all fertilizers used were made up of mineral fertilizers used for grain cultivation, 27 percent of the total mineral fertilizers used were applied to field forage crops. The number of fields treated with herbicides grew by 22 percent from 1965 to 1983, and constituted 41.4 percent of the total area treated with pesticides.

The application of chemical agents has had a significant economic impact. Thus, the use of mineral fertilizers during the 10th Five-Year Plan has resulted in an average annual production (in millions of tons) of about 32 for grain, over three for raw cotton, 3.3 for sugar beet, 9.4 for potatoes, and 5.6 for vegetables and melons. In all, the resultant supplemental gross agricultural production was 9.7 billion rubles and additional net income was 4.8 billion rubles.

The development of agricultural chemicalization has helped to increase crops, lessen the effect of unfavorable weather conditions, and has enhanced the growth of field harvests and livestock productivity.

At the same time there is a number of problems in agricultural chemicalization that remains unresolved. Farms have not as yet been fully provided with fertilizers, especially phosphorus fertilizers, pesticides, polymers, and other chemical materials. Livestock breeding is still in need of mineral feed supplements, forage preservatives, nutrient salt, and trace elements. One of the most important problems limiting the development of the phosphorus fertilizer industry is the insufficient amount of phosphorus-containing raw material that is made available to the industry. In that connection, the growth rate of phosphorus fertilizer production is predetermined by the growth rate of nitrogen and potassium fertilizer production.

The plan for deliveries of varied chemical products is not being observed. Problems concerned with improving the quality and expanding the assortment of chemical products delivered to agriculture have not been completely resolved.

The effectiveness of chemical usage in agricultural production is also being reduced because of the existing disproportions between the chemical agents delivered and the material-technical base of their utilization. Consequently, the yield obtained from the use of chemical agents, particularly mineral fertilizers, is below normal. Therefore, the subprogram must provide for a stage-wise balanced and dynamic development of all sectors in the agrochemical subcomplex which must above all secure the absolute fulfillment of the USSR Food Program tasks. The needs for mineral fertilizers and plant protection agents are slated to be completely satisfied for crop production on reclaimed lands. The

following actions should be particularly included into the subprogram's assignments:

-- the production and delivery of new forms of one-way highly concentrated mineral fertilizers (carbamide formaldehydes, Superphos, tormophosphates [?], polysuperphosphate), polymer complex, liquid complex as well as complex fertilizers (crystalline, ammonium polyphosphates, and granulated phosphorus-potassium fertilizers), fertilizers with trace element additives for use primarily on irrigated and arid lands for the purpose of increasing the guaranteed production of grain, particularly strong and hard wheat, corn and rice, vegetables, early potatoes, and forage;

-- a 50 percent increase in the nutrient ingredients of fertilizers and a higher quality of fertilizers;

-- an increase in the amount of mineral fertilizers applied per one hectare of land area, based on scientific recommendations in accordance with target indicators, and bringing the level of phosphorus up to the amount recommended by agrochemical science;

-- the organization and introduction of a rational mixed fertilizer structure in the Sel'khoztekhnika system, and the organization of a broad network of fertilizer mixing plants so that mineral fertilizers can be used in strict accordance with data from agrochemical soil analysis;

-- the manufacture of new highly effective chemical agents for plant protection, particularly herbicides, that are not hazardous to the natural environment and that are essential to the introduction of industrial technological methods of agricultural crop cultivation. At the same time, deliveries of mineral fertilizers and chemical plant protective agents should be balanced;

-- the production and delivery of ammonium forage phosphates, dicalcium phosphate, complex mineral supplements enriched with vitamins A, D, and E to increase livestock productivity;

-- the production and delivery of trace element salts in the form of glycerophosphates which are of high nutrient value and easily assimilated by animals;

-- the production and delivery of lysine and methionine in order to provide animals with a diet balanced in amino acids;

-- the production of carbamide concentrate which has a protein equivalent of 40 - 80 percent as well as forage supplements in the form of microgranules;

-- the assured procurement of forage in 1990 with the aid of chemical preservatives and a large part of the silage and hay that is being produced in the country, particularly for the long-term future;

-- the building of a production infrastructure for agricultural chemicalization which would include the construction of warehouses, machinery servicing stations, airplane landing runways, compost storehouses, and other facilities which would lead to a sharp reduction in the losses of mineral fertilizers and other chemical products and an increase in the their economic effectiveness;

-- an acceleration of research for developing the technology to produce more effective single-action and complex fertilizers that have high and ultra-high concentrations of nutrient ingredients;

-- expanded research on manufacturing new highly effective chemical agents for plant protection, particularly herbicides. Deliveries of chemical agents for plant protection are to be brought up to a level that provides agriculture with rational ratios between mineral fertilizers, pesticides, and plant growth hormones;

-- an expansion of the experimental base to test and introduce new chemical agents recommended as forage supplements, antioxidants, and substitutes for traditional forage;

-- an acceleration of the development of target normatives and chemicalization indices, and cartographic materials for rating and evaluating natural forage areas;

-- development of a social infrastructure, primarily the construction of housing for personnel.

The implementation of the proposed measures for the comprehensive target subprogram of chemicalization of the APK would make a

major contribution to the resolution of the long-term course outlined by the Party to increase the national economic effectiveness of agro-industrial complex operations.

6289
CSO: 1840/1058

PRODUCTION OF CHEMICALS FOR AGRICULTURE REVIEWED

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 1, 85 pp 2-5

[Interview with Vladimir Vladimirovich Listov, USSR Minister of the Chemical Industry by N. Zybin; Press office of the USSR Ministry of the Chemical Industry, date not specified]

[Text] Two and one-half years have passed since the adoption of the Food Program. During that time the ministries and departments comprising the agro-industrial complex have accomplished a lot toward fulfilling that program.

The October (1984) Plenum of the CPSU Central Committee, having noted the positive shifts that have taken place in agricultural production, has established new vital tasks for the intensification of the country's agriculture, and has approved the Long-Term Program for Land Development and Better Effective Use of Reclaimed Land that has been confirmed by the Politburo of the CPSU Central Committee for the 12th Five-Year Plan and up to the year 2000.

The editors of this journal have asked USSR Minister of the Chemical Industry V. V. Listov to tell our readers about the industry's contribution to the realization of the Food Program and the Long-Term Land Development Program.

[Question] Vladimir Vladimirovich, recently much is being said and written about the increased role chemical products and materials have played in the realization of the Food Program and in land development. Is this not an exaggeration?

[Answer] I don't think so. If you can imagine all of the sectors of the national economy that are taking part in the fulfillment of the Food Program and the Long-Term Land Development Program as a tall building, then you will find chemists neither on the very top or very bottom stories. One cannot exaggerate the role of the chemical industry in such a national undertaking. Moreover, that role cannot be underestimated either. We now live at a time when all of the activities of the agro-industrial complex are already considerably dependent upon the development of chemistry and upon the application of chemical products and materials.

Chemical industry workers are supplying over 200 kinds of products to the industries that are leading the struggle to increase the production of grain, meat, milk, eggs, vegetables, fruits, and industrial crops. The Ministry of the Chemical Industry has a large share in the production of mineral fertilizers. During the four years of the current Five-Year Plan alone we have sent to agricultural workers 270.0 thousand tons of polyethylene film, 606.2 thousand tons of plant protection materials, 45.3 thousand tons of forage preservatives, 118.4 thousand tons of forage additives and 18.4 thousand tons of trace elements, 130.5 thousand tons of hay baler twine, 1,469.5 thousand tons of ground limestone for preparing feed concentrate as well as quite a few other chemical products, especially polymers.

Various polymers have become indispensable in modern agriculture. The use of those polymers reliably guarantees a significant improvement in all processes of the cultivation, storage, and transportation of products. The amount of plastics alone sent by the chemical industry to the farms during the last ten years is double the amount delivered in the previous decade.

The utilization of polymers in agriculture is not merely a substitution of traditional materials, but, as I already have said, polymers constitute a completely new material which exceeds a number of characteristics of steel, iron, copper, and wood.

During the years of the current Five-Year Plan polymer production has increased by 1.4 times, and the use of polymers in agriculture has increased almost nine-fold. Practice has shown that they are very suitable for light-weight construction.

When these materials are used, material costs are reduced by four to five times, construction time is shortened, labor costs are reduced, and the quality of structures is improved and their service period is lengthened.

[Question] As far as we know, various kinds of polymer films are providing enormous benefits in agriculture.

[Answer] Polymer film is an excellent material for greenhouses. The film protects silos and can be used as a soil mulch. Vegetable growers, horticulturists, and flower growers use this film very willingly. Hydrophilic film, for example, provides for an even distribution of the moisture that evaporates from the soil. The series production of films with completely new and unique properties is currently being set up. Some of those films, in contrast to conventional polyethylene films, are spontaneously degraded by sunlight and are mixed with the soil or are rapidly dissolved in the soil. This type of film is completely harmless to natural organisms and the soil.

The chemical industry has currently set up the production of polyvinylchloride film and water-soluble polyvinylethanol film for hothouse farms for the purpose of packing pulverized chemical products and for transporting and storing mineral fertilizers. Carbon black and anti-static stabilized films have the specific qualities of being impermeable to gas, completely harmless, and frost-resistant.

In accordance with the decisions of the October (1984) Plenum of the CPSU Central Committee, the use of polymers has been expanding in land development and water management construction. This includes not only films, but plastic drain pipes, flexible tubes, various machine and equipment parts and units, and accessories. As a rule, items made out of chemical materials are significantly cheaper than metallic products and are easier to manufacture. The service period of plastic parts is longer than that of metallic ones. They do not corrode and do not require painting. In sum, productivity in land development is increasing. Experience has shown that the exploitation of plastic drain pipes in the non-black soil zone and the degree of mechanization in construction have increased by almost 50 percent.

I should like to take this opportunity to call the attention of

the readers of KHIMIYA V SEL'SKOM KHOZYASTVE, who constitute a large number of specialists in various fields, to the following very important situation. Namely, we supply polymers to those sectors of the agro-industrial complex in which the polymers are technically essential and where they are having a significant economic impact. There is a certain group of specialists who thinks that plastics are after all, an inexpensive and practically gratuitous material. This is far from the truth. Valuable raw materials are used for the manufacture of polymers and plastics. Those materials are manufactured with the help of highly complex equipment and through the application of advanced technology. One ton of plastic costs the state no less than a ton of steel or iron. Therefore, a rational and prudent regard for the work of chemical industry workers and their products is a requirement of top priority. Surely, it is no secret that many thousands of square meters of film could have been used repeatedly instead of being thrown onto garbage dumps.

Thirty-five varieties of plastics are currently being used in various sectors of agriculture. The volume of this production for agriculture from 1965 to 1984 has grown by 30 times! The range of polymer utilization is quite diversified. For example, low-pressure polyethylene is being successfully used to manufacture parts for combines and tractors, and for cotton cultivation and harvesting machines (rotors, housing units, cylinder heads, levers, couplings, blocks, etc.). Such parts are lighter, less expensive, and more reliable. Whereas ten years ago a single tractor had 70 plastic parts, in 1980 that number was already 200. The production of plastic parts for similar machinery during this period has grown by five times.

[Question] Judging by these facts, it would seem that the chemical industry has moved ahead significantly and its scientific-technical and production potential has grown.

[Answer] Absolutely. I should like to tell you about the enormous attention that our Communist Party and Soviet Government have been giving to the development of the chemical industry.

As you know, the May (1958) and December (1964) Plenums of our Party's Central Committee played a decisive role in the vigorous progress of the chemical industry. During the period from 1960 to 1980, 90 percent of the present fixed industrial-production capital was put into operation, 93 percent of plant capacity for

plastics production, 80 percent of plant capacity for the production of chemical fibers, and 65 percent of plant capacity for the production of soda ash was put into operation.

During this twenty-year period the volume of the entire country's industrial production increased four-fold, but chemical industry production increased by eight times! Consequently, the lead pace-setting development of chemistry meant that its share of the country's gross national product grew from 3.7 to 6.8 percent.

Because of the selfless labor of our scientists, technologists, designers, economists, and workers, we have achieved major successes.

Our domestic chemical industry, together with enterprises of other ministries and departments, are today manufacturing more than 70,000 different products. During the last 20 years the production of the basic types of products increased by six to ten times. The production of plastics and synthetic resins increased by more than 14 times, and the production of synthetic detergents increased by 50 times.

The chemical industry's potential has grown significantly during the 10th Five-Year Plan. Many new chemical enterprises have become operational. Among those are the Omsk, Prikum, and Shevchenko plastics plants, the Yavan Electrochemical, the Zimin and Tomsk chemical plants. These enterprises are the last word in technology and are equipped with first-class production lines which allows us to increase the production of polymers and other chemical products for the leading sectors of the economy and for all subsectors associated with the agro-industrial complex, and primarily, with agriculture.

[Question] The Food Program mentions the need to increase livestock production. What is chemistry's role here?

[Answer] There are more than 400 preparations known to modern science that are being used successfully as forage supplements for animals. These include proteins of microbial origin, amino acids, vitamins, enzymes, and various pharmacological and veterinary preparations. Our domestic industry has succeeded in producing a part of those substances. We are building up a large-scale production of methionine, an amino acid which

increases the productivity of fowl and animals. Among the various additives are salts of such trace elements as manganese, zinc, cobalt, copper, and boron. We are currently putting together a complex program to find supplemental reserves for producing these products which are so essential to livestock breeding.

Because of the chemical industry's successes in producing formic and acetic acids, livestock workers in many of the country's oblasts are successfully meeting the procurement quotas for forage through the use of chemical preservatives. Consequently, milk yields have been going up and forage expenditures are significantly decreasing.

Warehouses made out of polymer materials are being built on livestock farms for storing machinery, crates, and fertilizers. Such warehouses are technically efficient because builders can assesmble and dismantle these buildings without the use of heavy forklift trucks and cranes.

Permanent canvas framed structures have proven to be very effective for housing animals and poultry in many farms of the Ukraine, Moldavia, Lithuania, and other republics. Such structures require one-third less material and cost one-half as much as do buildings made out of brick, concrete, or wood.

In Moscow Oblast and in the Baltic republics agricultural structures (mainly chicken coops) are being built with walls made of totally compression-molded fiber glass panels with soft, heated covers made of reinforced film and plastic foam.

[Question] The careful storage of harvests into reliable bins without losses, the avoidance of gradual losses during transport, and the rational use of harvests in the market place all make up a very responsible task. Surely, chemical workers have some role to play here too?

[Answer] This is the very situation where chemistry is absolutely indispensable. Chemical materials and products have come to be widely utilized in the canning, baking, confectionery, wine-making, meat and dairy, fish, and other areas of the food industry. For example, special polyethylene sheets are used as container liners for transporting flour, groats, sugar, and salt. Polyethylene sheets are used to make conveyers for dairy and

confectionery enterprises.

An enormous amount of polymer packaging goods is used to wrap all kinds of meat and dairy products, sweet dishes, and various convenience foods. The collective of the Prikum Plastics Plant is setting up the production of a special extra-strength film for packaging meat and meat semi-finished products. The collective of the Shevchenko Plastics Plant is setting up the production of polystyrene foam sheet and film for packaging food products. This plastic sheet is a competitor and substitute for paper, cellophane, and cardboard.

I should like to mention in addition, one very original invention of our scientists -- polymer membranes. According to the data of specialists, 38 million tons of skim milk and buttermilk and 12 million tons of whey are formed annually in the processing of milk. More than one-half of this amount of whey is wasted. Food industry workers have estimated that if one applied no-waste technology to the overall utilization of raw material, one could produce an additional 110 thousand tons of protein, 120 thousand tons of fat, and 145 thousand tons of lactose. But how? The polymer membranes which have been designed by our scientists were able to solve this problem. Valuable protein can be extracted from the whey by the use of membrane technology. The concentrate is used to produce cottage cheese, powdered proteins, and sweets for children. Membranes are also used in the production of cheese.

Equipment which employs membrane technology has been installed at the Podol City Dairy Plant, the Rokishkish Cheese Plant (Lithuanian SSR), and the experimental plant of the All-Union Scientific Research Institute of the Dairy Industry (Moscow). This method has been introduced in Rostov, Dnepropetrovsk, Ryazan', and Ivanovo.

Chemical industry workers are also directly contributing to an increase in food product reserves. Our enterprises are producing common salt, baking soda, additives for bread baking, and dyes for the confectionery industry. All of these products are of high quality and purity. New shops are being built and new plants are being put into operation for the production of soda in Sterlitamak and Lisichansk.

[Question] The 11th Five-Year Plan is coming to an end. Work is

proceeding full speed ahead on the 12th Five-Year Plan. What problems are of concern to you as a leader of the country's leading industry?

[Answer] As you have seen, much has been done, but there is a great deal of work that lies ahead.

We are directed toward that work by the decisions of the 26th Party Congress, the subsequent plenums of the CPSU Central Committee, and the statements of General Secretary of the CPSU Central Committee, Chairman of the Presidium of the USSR Supreme Soviet K. U. Chernenko.

The chemical industry as a base sector of industry is not as yet satisfying the country's national economic need for a whole series of very important chemical materials and products.

In responding to the Party's call to complete the Five-Year Plan in a worthy manner, the chemical industry has taken on an intensified plan for 1985 which is aimed at a significant increase in production, an improvement in economic indicators, an accelerated intensification of the economy by introducing the achievements of science and technology, an increase in productivity, and a reduction in production costs. This course of action will be continued in the 12th Five-Year Plan as well.

An increase in the production of chemical products is the task which has been set in the area of production for the agro-industrial complex. Special attention will be given to satisfying the requirements of production volume, and consequently, proportional production for the application of mineral fertilizers and chemical plant protection agents, an increase in the production and expansion in the spectrum of forage preservatives. The production of pipes will be significantly increased for land development and water management needs, as will be the production of crating and packaging materials, V-belts, and other spare parts for agricultural machinery.

The year 1985 is unusual in many respects. This is the year of active preparation for the 27th Party Congress, the 40th anniversary of the Soviet people's victory in the Great Fatherland War, and the 50th anniversary of the Stakhanovite movement.

All of this gives special meaning to our work and compels us to work with doubled energy.

In completing our discussion, on behalf of myself personally, and on behalf of the many thousands of workers in the chemical industry, I should like to wish the readers of KHIMIYA V SEL'SKOM KHOZYASTVE a Happy New Year!

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COMBINED USE OF GROWTH REGULATORS, HERBICIDES AND FERTILIZERS UNDER GRAIN CROPS

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 1, Jan 85 pp 9-17

GRUZDEV, L. G., candidate of biological sciences, VNIPTIK [expansion unknown]

[Abstract] One of the most effective means of meeting the need for increased and improved harvests is the use of an appropriate combination of growth regulators, herbicides and fertilizers. It is felt that the success of the USSR Food Program depends on just such a rational approach. Long-term research (1971-1984) on the use of such combinations of agricultural chemicals under various grain crops has led to the identification of criteria that need to be followed for obtaining the desired end effects, which are summarized in a schematic form. The net effect was to reduce the amount of chemicals that had to be employed to increase the quantity and quality of the grain harvest while diminishing losses due to various causes. Agrochemical and economic analyses of various combinations of agents under laboratory and field trials has resulted in application for their approval by the USSR Ministry of Agriculture for rapid implementation in the national economy. Further steps will be taken to utilize as much as possible, and feasible, Soviet chemicals, and to expand the number of combinations undergoing testing. Figures 6; references 16: 15 Russian, 1 Western.
[1957-12172]

UDC 633.1:631.816

EFFECTS OF MINERAL FERTILIZERS ON TRITICALE HARVESTS

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 1, Jan 85 pp 30-31

FEDOROV, A. K., doctor of biological sciences, All-Union Institute of Plant Breeding, and KHLYUPKIN, V. M., candidate of agricultural sciences, "Gorki Leninskiye" Experimental Scientific Research Base

[Abstract] Several varieties of triticale cultivated for food and feed were studied for the effects of different concentrations of mineral fertilizers on yields of soddy-podzolic soils heavy in clay. Comparative analysis was conducted on the effects on Moscow-121 barley. The general impression was that triticale was much more responsive to soil enrichment with mineral fertilizers than the barley. The responsiveness in grain yield of triticale LG-29, intended

for human consumption, was particularly high, yielding 69.7 centners/ha on $N_{100}P_{296}N_{440}$. The grain protein content approached 15.4%. The results of single fertilizer application were evident after two and three years.
[1057-12172]

UDC 632.952:633.16

SYSTEMIC FUNGICIDES AND GRANOSAN AGAINST BARLEY SMUT

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 1, Jan 85 pp 31-32

TALVOYA, P. A., candidate of agricultural sciences, Estonian NIIZiM [expansion unknown]

[Abstract] Field trials were conducted in Estonia in 1972-1983 on the control of barley smut (Helminthosporium, Fusarium) using a combination of systemic fungicides and Granosan (methylmercuric chloride), in view of the extent of the problem in Estonia. Analysis of several combinations showed that optimal results were obtained with a combination of the system agent vitavax (Uniroyal) and Granosan. Pretreatment of the seeds 2 months before planting with vitavax alone (1.5 g/T) or in combination with Granosan (1.5 kg/T Granosan, 0.75 kg/T vitavax) resulted in 100% elimination of barley smut in 1982. In addition, combination of Granosan with a systemic fungicide had little effect on the latter.
[1057-12172]

UDC 632.954:634.7

GROWTH OF CURRANTS AND SEA BUCKTHORN AND APPLICATION OF HERBICIDES

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 1, Jan 85 pp 32-34

SHLYAPNIKOVA, A. S., candidate of agricultural sciences, Experimental Fruit Station Timiryazev Agricultural Academy

[Abstract] Effects of herbicides on currant and sea buckthorn seedlings were studied for a three year period (1979-1982) at the Experimental Fruit Station, to determine optimal conditions for weed control without adversely affecting seedling growth and development. Analysis of the growth data demonstrated that standard herbicides should be applied within 7-10 of planting in low doses (2 kg/ha lenatsil [sic] + 1.5 kg/ha after 2 months; 0.5 kg/ha simazin [sic] + 0.5 kg/ha after 2 months) without negative consequences for seedling root development. Annual weeds are entirely eliminated with the herbicide doses indicated. Perennial weeds present a more serious problem and require field treatment prior to planting.
[1057-12172]

UDC 632.954+631.8

MICROSTRUCTURE OF HERBICIDES GRANULATED WITH CARBAMIDE

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 1, Jan 85 pp 45-47

KATSYUTSEVICH, Ye. V. and VASIL'YEV, V. Yu., All-Union Scientific Research and Technological Institute of Herbicides

[Abstract] Microstructural analysis was conducted on granulated preparations of herbicide-fertilizer mixtures, to assess factors yielding optimal products with prolonged delivery of bioactive components. Evaluation of preparations obtained by using seven herbicides and carbamide showed the formation of transparent crystals with right angles and distinct planar separations. The herbicides tested (butyl-(2,4-dichlorophenoxy)acetate, octyl-(2,4-dichlorophenoxy)-acetate, illoksan [sic], yalan [sic], lenatsil [sic], triallat [sic], atsetokhlor [sic]) showed that soluble herbicides with a MW of 300 or less form emulsions with the carbamide fertilizer. However, in each case--whether emulsions or crystals--stable, dispersed systems were obtained with the use of carbamide. It is thus evident that a variety of dispersion systems can be obtained within a given class of herbicides by means of minor chemical modifications.
[1057-12172]

UDC 576.852.1+577.152.3

PRODUCTION OF HIGH PURITY ACYLASE PREPARATIONS FROM ACTINOMYCETE CULTURE OF STREPTOVERTICILLIUM

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 20, No 5, Sep-Oct 84 (manuscript received 25 Apr 83) pp 598-603

PENZIKOVA, G. A., ORESHINA, M. G., LEVITOV, M. M. and BARTOSHEVICH, Yu. E., All-Union Scientific Research Institute of Antibiotics, Moscow

[Abstract] A study is presented of the possibility of separating two acylases and producing high purity enzyme preparations from a culture fluid filtrate of streptovercillium number 62. The organism was cultivated in deep aerated flasks with rocking at 27°C for four days. Acylase of microbe origin is considered particularly promising for the production of new antibiotics and their intermediates, optically active amino acids and other important substances. The studies make possible the production of two highly purified enzyme preparations--aminoacylase and penicillin-V-acylase--from the summary preparation isolated from the culture fluid filtrate, proving the capability of this actinomycete to produce two types of acylase similar to Fusarium semitectum. Figures 2; references 11: 8 Russian, 3 Western.
[1591-6508]

INTERACTION OF SPIN-LABELED ANALOG OF METHACYNE WITH BUTYRYLCHOLINESTERASE

Moscow BIOFIZIKA in Russian Vol 30, No 1, Jan-Feb 85
(manuscript received 11 Jun 84) pp 23-26

DOROKHOV, K. Ye., GRIGORIAN, G. L., KARDANOV, N. A., ZHDANOV, R. I., TRIFONOVA, S. A., GODOVIKOV, N. N. and KABACHNIK, M. I., Institute of Heteroorganic Compounds, USSR Academy of Sciences, Moscow; Scientific Research Institute for Biological Testing of Chemical Compounds, Kupavna, (Moscow Oblast')

[Abstract] A spin-labeled derivative of methacyne, a muscarinic cholinolytic as well as a reversible cholinesterase inhibitor, was obtained. The influence of various cholinesterase inhibitors on its bonding with butyrylcholinesterase was studied. The bonding parameters were determined by a study of absorption isotherms constructed from EPR spectra, and also by the method of enzyme kinetics. The spin-labeled methacyne analog was determined to be a reversible

competitive cholinesterase inhibitor stronger than methacyne itself. It bonds with the active center of butyrylcholinesterase with $K_{diss} = 1.5 \cdot 10^{-5}$M and extracts hexamethonium, tetraethyl ammonium and eserine from the complex, but not DPP. The nature of the EPR spectrum of the radical in complex with butyrylcholinesterase indicates the presence of steric hindrances in the microvicinity of nitroxyl, indicating localization of the active center in a depression of the macromolecule surface. Figures 2; references 16: 9 Russian, 7 Western.
[1741-6508]

UDC 575.24:582.1

MUTAGENIC EFFECT OF BENOMIL

Alma Ata IZVESTIYA AKADEMII NAUK KAZAKHSKOY SSR: SERIYA BIOLOGICHESKAYA in Russian No 6, Nov-Dec 84 pp 1-3

BIYASHEV, G. Z., NURZHANOVA, A. A., NAMAZBEKOVA, N. K. and PATAKHOVA, A. M., Institute of Botany, Kazakh SSR Academy of Sciences, Alma-Ata.

[Abstract] A study was made of the influence of the pesticide benomil on the genetic structure of wheat cells. Air-dried seeds and sprouts of Kazakhstan-3 wheat were treated with benomil at 50, 20, 15, 10, 6.7 and 1% in distilled water. Analysis of structural mutations of chromosomes in experimental and control groups was performed using the anaphase method, and the results were statistically processed. Data on the frequency of chromosomal aberrations following treatment of wheat seeds with benomil show that at the dose used in practice, benomil causes changes in chromosomal structure, the number of mutations increasing by a factor of 3. The fungicide is safe for wheat in the genetic respect only in concentrations of not over 1%. References 7: 6 Russian, 1 Western.
[1051-6508]

UDC 576.895.4

LABORATORY STUDIES OF EFFECT OF EXPERIMENTAL BATCH OF BACTERIAL PREPARATION BACILLUS THURINGIENSIS (SEROTYPE 14) ON VARIOUS GROUPS OF HYDROBIONTS

Alma Ata IZVESTIYA AKADEMII NAUK KAZAKHSKOY SSR: SERIYA BIOLOGICHESKAYA in Russian No 6, Nov-Dec 84 pp 22-25

ROGATIN, A. B. and BAYZHANOV, M., Institute of Zoology, Kazakh SSR Academy of Sciences, Alma-Ata

[Abstract] A study was made of the possible influence of an experimental batch of a bacterial preparation prepared from Bacillus thuringiensis on a group of hydrobionts from samples taken from natural bodies of water by trawling with gauze nets. Benthic forms were washed from the substrate with a screen.

Experiments were performed in glass vessels using water taken from the same body of water. The minimum lethal concentration of the preparation for blood-sucking mosquito larvae was 0.1 mg/l, which was therefore used as the initial test dosage. The bacterial preparation was found to be nontoxic for most hydrobionts. Pathogenicity was observed for larvae of chironomids, particularly Cricotopus silvestris, allowing it to be used after comprehensive study for control of these agricultural pests. References: 7 Russian.
[1051-6508]

UDC 546+577.1

SUMMATIONS AND TRENDS IN BIOCOORDINATION CHEMISTRY

Kiev VISNYK AKADEMIYI NAUK UKRAYINS'KOYI RSR in Ukrainian No 3, Mar 85 pp 16-20

YATSIMIRSKIY, K. B., academician, Ukrainian SSR Academy of Sciences

[Abstract] The field of biocoordination chemistry came into its own as a scientific specialty some 15 to 20 years ago, and represents that subspecialty of coordination chemistry concerned with the behavior, role and metabolic transformation of metals in living systems and the environment. In the USSR, the leading center devoting considerable effort in this direction is the Institute of Physical Chemistry of the Ukrainian SSR Academy of Sciences, and in 1981 cooperation in such studies has reached international proportions with joint research projects involving the USSR, German Democratic Republic, Bulgaria, Czechoslovakia, and so forth. Studies on the coordination chemistry of metals in the biological context has brought us a better understanding of membrane function and its translocation mechanisms, enzyme function, and the role of metal charge in various ligand-macromolecule complexes. On the basis of such studies, novel antineoplastic agents utilizing gold and platinum have been formulated, for example, while other metals, such as lithium, have received further definition as psychotropic agents. The involvement of metals in charge transfer in proteins promises to further expand engineering biochemistry and biotechnology with the creation of, for example, biochips for computer applications. References 11: 9 Russian, 2 Western.
[1841-12172]

UDC 577.27:57.083.3

IMMUNOCHEMICAL INVESTIGATION OF BACTERIORHODOPSIN USING MONOCLONAL ANTIBODIES

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 1, No 11, Nov 84
(manuscript received 10 May 84) pp 1161-1170

VTYURINA, I. Yu., KURYATOV, A. B., KISELEV, A. V., KHOROSHILOVA, N. I., OVECHKINA, G. V., ABDULAYEV, N. G., TSETLIN, V. I. and VASILOV, R. G., Institute of Bioorganic Chemistry imeni M. M. Shemyakin, USSR Academy of Sciences, Moscow

[Abstract] The present work deals with study of bacteriorhodopsin (BR) topography in purple membrane by means of monoclonal antibodies against different parts of protein molecule on the membrane surface whose antigenic specificity was determined using modified BR derivatives and a wide selection of overlapping peptides obtained by enzymic or chemical degradation of these reagents. Five antigenic determinants were localized in the following parts of BR: $<Glu^{1}$-Met^{20} including one of three amino acid residues of the N-terminal part; Gly^{33}-Met^{56}, including Aps^{36} and/or Asp^{36} and Phe^{42}; Phe^{156}-Met^{163}, including Phe^{156}; and Glu^{194}-Leu^{207}, including Glu^{194}, and Pro^{200}-Leu^{207}. Experimental data were obtained showing presence of two polypeptide fragments projecting from the membrane in the sequence range 4-65 and 156-231. In connection with previous data and segments 66-72 and 231-248, these results show that each of the segments 4-65 and 156-231 consist of a maximum of two transmembrane segments. Figures 3; references 30: 2 Russian, 28 Western (4 by Russian authors).
[1822-7813]

UDC 577.11.611-018.82:615.357

EFFECT OF NEUROPEPTIDE TAFTSIN AND ITS DERIVATIVES ON CONTENT OF NICOTINAMIDE COENZYMES AND ACTIVITY OF CYTOCHROME-C-OXIDASE OF BRAIN TISSUES

Kiev UKRAINSKIY BIOKHIMICHESKIY ZHURNAL in Russian Vol 57, No 2, Mar-Apr 85
(manuscript received 11 Jun 84) pp 82-84

ROK'YA BEGAM, Odessa Medical Institute imeni N. I. Pirogov

[Abstract] The influence of Taftsin, a neuropeptide, and its derivatives: l-Leu-l-Lys-l-Pro-l-Arg and l-Thr-l-Ala-l-Val-l-Arg on the content of nicotinamide coenzymes in brain tissues and on the activity of cytochrome-C-oxidase was studied on white Wistar rats. It was shown that $NADP^{+}$ content increased significantly along with the activity of cytochrome-C-oxidase, especially in emotiogenic brain structures. Taftsin appeared to exhibit a stimulating effect on the animals. Figure 1; references 14: 11 Russian, 3 Western.
[1830-7813]

UDC 577.175.82.02

NATURE OF CATION-BINDING GROUPS OF BINDING SITES FOR [[^{3}H] Tyr^1,D-Ala^2, D-Leu^5] ENKEPHALIN

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 11, No 2, Feb 85 (manuscript received 18 Apr 84) pp 153-161

ZAYTSEV, S. V., PORODENKO, N. V. and VARFOLOMEYEV, S. D., Moscow State University imeni M. V. Lomonosov, Interfaculty Scientific Research Problem Laboratory of Molecular Biology and Bioorganic Chemistry imeni A. N. Belozerskiy

[Abstract] Study of the effect of pH on binding of labelled, stable analog of enkephalin, viz, [[^{3}H] Tyr^1, D-Ala^2, D-Leu^5] enkephalin and also of the effect of bivalent and trivalent ions of metals on binding of [^{3}H] enkephalin with high-affinity and low-affinity receptors of rat brain membranes was described and discussed. Alkaline-earth metal ions were bound with a deprotonated group (pKa, 7,0) of the high-affinity receptor and activated the latter. The effect of cations on interaction of the ligand with a low-affinity binding site did not depend on pH. It was assumed that the high-affinity binding site contains phosphoric acid residue and the low-affinity binding site contains an imidazole group. This was confirmed by data obtained by chemical modification of the membrane preparation by diethylpyrocarbonate. Figures 8; references 15: 2 Russian, 13 Western.
[1821-2791]

UDC 547.426(211'466.3'+24'118).057

SYNTHESIS AND STUDY OF PROPERTIES OF ORGANOPHOSPHORIC REGULATOR OF HEMOGLOBIN OXYGENATION

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 11, No 2, Feb 85 (manuscript received 26 Jun 84) pp 187-191

USHAKOVA, I. P., TUVIN, M. Yu., SEREBRENNIKOVA, G. A., KOL'TSOVA, G. N., VYAZOVA, Ye. P., ROZENBERG, G. Ya. and YEVSTIGNEYEVA, R. P., Moscow Institute of Precision Chemical Technology imeni M. V. Lomonosov, Central Scientific Research Institute of Hematology and Blood Transfusion, Moscow

[Abstract] This study was prompted by the recent discovery of the possibility of creating an artificial oxygen carrier based on human hemoglobin. One of the most important conditions of effective transport by such an extra erythrocyte hemoprotein is the presence in the transfer system of a regulator of reversible oxygenation of hemoglobin. Many studies involve investigation of various compounds as such regulators. It has been found that organophosphoric compounds containing 2-6 phosphate groups regulate the process of reversible oxygenation of hemoglobin. In view of this, racemic 1-O-(ε-aminohexanoyl)-2,3-diphosphoglycerin was tested for functional activity as a regulator of reversible oxygenation of human hemoglobin. Hemoglobin without the regulator had partial

pressure of oxygen at 50 percent saturation of hemoglobin equal to 2.6+0.17 kPa, hemoglobin in a mixture with 1-O-(ε-amino hexanoyl)-2,3-diphosphoglycerin had 3.5 kPa and hemoglobin in a mixture with 2,3-diphosphoglyceric acid had 4.4 kPa. The compound obtained was capable of regulating the affinity of hemoglobin for acid although to a lesser degree than natural 2,3-diphospho-D-glyceric acid. Figure 1; references 23: 3 Russian, 20 Western.
[1821-2791]

UDC 579.222.7'1124.5:547.366'118.057:579.842.14

SPECIFICITY OF ENZYMES OF O-ANTIGEN BIOSYNTHESIS IN SALMONELLA ANATUM TOWARDS POLYPRENOL DERIVATIVES OF DIFFERENT CHAIN LENGTH AND SATURATION

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 11, No 2, Feb 85
(manuscript received 10 Aug 84) pp 219-226

KALINCHUK, N. A., DANILOV, L. L., DRUZHININA, T. N., SHIBAYEV, V. N. and KOCHETKOV, N. K., Institute of Organic Chemistry imeni N. D. Zelinskiy, USSR Academy of Sciences, Moscow

[Abstract] Phosphates of some polyprenols with different length of carbon chain (C_{10} to C_{100}) were chemically synthesized by interaction of the appropriate polyprenols with o-phenylenechlorophosphate. Capacity of the compounds obtained and also capacity of some dolichols (polyprenols with an alpha-saturated isoprene link) to take part in biosynthesis reactions of O-specific polysaccharide of Salmonella anatum was studied. C_{30}-C_{80}-polyprenol phosphates with an unsaturated alpha-isoprene link were just as effective as the natural reaction substrate, undecaprenyl phosphate, in the enzymic system while C_{15}- and C_{100} - polyprenols were less active. Enzymes participating in biosynthesis of the repeating link utilize derivatives of polyprenols with saturated alpha-isoprenol link much worse. The length of the polyprenol residue was of paramount importance for the polymerization reaction; its reduction noticeably decreased the effectiveness of corresponding derivatives as reaction substrates. References 22: 10 Russian, 12 Western.
[1821-2791]

UDC 577.113.6:547.262'118

USE OF ETHYLDICHLOROPHOSPHITE IN SYNTHESIS OF ALKYLATING PHOSPHOAMIDE DERIVATIVES OF NON-IONIC ANALOGS OF OLIGONUCLEOTIDES

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 11, No 2, Feb 85
(manuscript received 16 Feb 84, final draft received 30 Jul 84) pp 231-238

LEVINA, A. S. and IVANOVA, Ye. M., Novosibirsk Institute of Organic Chemistry USSR Academy of Sciences, Siberian Department

[Abstract] A convenient method of introducing an alkylating grouping into esterized oligonucleotide via a phosphamide bond consisting of two sequential

stages, formation of a 3'- or 5'-hydrophosphoryl derivative of oligonucleotide with the aid of ethyldichlorophite and reaction of the compound obtained with 4-[N-methyl-N-(2-chloroethyl) amino]benzylamine in the presence of CCl_4 is described and discussed. Use of the method made it possible to prepare 3'- and 5'-derivatives of oligonucleotide. Alkylating derivatives of 2 oligonucleotides, ethylated by the internucleotide residues, were synthesized. They are: $RClNH\dot{p}(Tp)_7T(Lev)$ and $(C_6H_5NH)_2$ $\dot{p}T\dot{p}G\dot{p}C\dot{p}T\dot{p}C\dot{p}T\dot{p}G\dot{p}G\dot{p}T\dot{p}T\dot{p}T\dot{p}NHRCl$. ($\dot{p}$ designates ethylphosphate) Figures 3; references 22: 17 Russian, 5 Western.
[1821-2791]

UDC 577.113.(4+6):213.7

CONDENSATION OF OLIGODEOXYRIBONUCLEOTIDE PHOSPHORIMIDAZOLIDES IN COMPLEMENTARY COMPLEX--GENERAL METHOD OF SYNTHESIZING NATURAL AND MODIFIED DNA DUPLEXES

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 11, No 2, Feb 85 (manuscript received 9 Jul 84, Final Draft 13 Sep 84) pp 239-247

ISAGULYANTS, M. G., IVANOVSKAYA, M. G., POTAPOV, V. K. and SHABAROVA, Z. A., Moscow State University imeni M. V. Lomonosov, Chemistry Faculty and Interfaculty Problem Scientific Research Laboratory of Molecular Biology and Bioorganic Chemistry imeni A. N. Belozerskiy

[Abstract] Possibility of use of template-directed condensation of imidazolides of oligonucleotides to produce DNA-complexes, containing 3',5'-phosphoamide or 3', 5'-pyrophosphate bonds is studied and discussed. Condensation of phosphoimidazolides of oligodesoxyribonucleotide in the complementary complex formed by them produced 18-link oligonucleotides, containing 3',5'-pyrophosphate and phosphoamide intermediate bonds in the fixed position. Yield of products of template-directed condensation ranged from 40-80 percent. Stability of DNA-duplex and nucleophilic properties of the acceptors of the preactivated phosphates and the reaction conditions were factors affecting the efficiency of template-directed condensation. It was assumed that matrix-directed condensation of oligonucleotides proceeds according to an associative mechanism with formation of an intermediate with a trigonal bipyramid structure. The reaction may be used for assmbly of natural and modified gene fragments and for reparation of single-strand breaks in DNA-duplexes. Figures 6; references 35: 10 Russian, 25 Western.
[1821-2791]

UDC 547.458(33+41).057:842.15

SYNTHESIS OF OLIGOSACCHARIDE FRAGMENTS OF SHIGELLA FLEXNERI O-SPECIFIC POLYSACCHARIDES. II. SYNTHESIS OF TRISACCHARIDE Glcα1→3Rhaα1→2Rhaα1→OMe and TETRASACCHARIDE GlcNAcβ1→2(Glcα1→3)Rhaα1→OMe

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 11, No 2, Feb 85 (manuscript received 30 Jul 84) pp 254-263

BAKINOVSKIY, L. V., GOMTSYAN, A. R., BAYRAMOVA, N. E. and KOCHETKOV, N. K., Institute of Organic Chemistry imeni N. D. Zelinskiy, USSR Academy of Sciences, Moscow

[Abstract] Step-wise synthesis of methylglycosides of linear trisaccharide and branched tetrasaccharide by glycosylation is described and discussed. These oligosaccharides represent the O-antigenic polysaccharides of Shigella flexneri serotypes 2b, 3a, 5b and X. References 13: 5 Russian, 8 Western. [1821-2791]

UDC 577.17'.17

SYNTHESIS OF (E)- AND (Z)-ASARONES AND THEIR ANALOGS

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 11, No 2, Feb 85 (manuscript received 6 Jul 84) pp 270-275

SHIROKOVA, Ye. A., SEGAL', G. M. and TORGOV, I. V., Institute of Bioorganic Chemistry imeni M. M. Shemyakin, USSR Academy of Sciences, Moscow

[Abstract] A method for producing physiologically active (E)- and (Z)-asarones and (E)-1-(3-methyl-1-buteryl)-2,4,5-trimethoxybenzine, a structural analog of precocene anti-juvenile hormone is described and discussed. Both (E)- and (Z)-asarones act as cardiac depressants in experiments on rabbits and rats; they act as hypotensives and prolong barbiturate-induced sleep. (E)-asarone produced a more pronounced effect in all tests. It is common knowledge that sweetsedge (Acornus calamus Linn) root extract contains (E)- and (Z)-asarones. (E)-isomer produces pronounced cholesterinemic action and is the active ingredient of the vasodilating and spasmolytic preparation "Escarol". (Z)-asarone is structurally similar to precocene and produces antiphidantic and chemo sterilizing actions against some insects. References: 12 Western. [1821-2791]

UDC 631.1:577.152.3+577.121.2

METHODS OF ANALYSIS OF COMPONENT COMPOSITION OF PROTEINASE AND α-AMYLASE INHIBITORS IN CEREALS

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 21, No 1, Jan-Feb 85 (manuscript received 22 Apr 82) pp 92-100

KONAREV, Al. V., All-Union Scientific Research Institute of Plant Protection, Leningrad.

[Abstract] Protein enzyme inhibitors are widely used in the plant world. Their functions are quite varied. They may serve as enzymatic activity regulators, for example, in the accumulation or mobilization of starch and reserve proteins during ontogenesis of grain. Inhibitors may play a protective role against pests and disease, hindering hydrolysis of plant tissues by forming enzymes. This leads to an increase in the energy cost of assimilating food and has a negative influence on the pests, limiting their population. Furthermore, inhibitors can decrease the food value of legumes and cereals for man and animals. This list of possible inhibitor functions explains the interest in these proteins among specialists in various areas of biochemistry. Wheat contains a complex set of inhibitors of insect, mammal, bacterial and grain hydrolases. Methodological approaches must be developed allowing more reliable determination of the properties of various types of enzyme inhibitors as quickly and accurately as possible. The authors have developed simple methods for identification of the components of α-amylase and proteinase inhibitors. It has been found that the electrophoretic isoelectric and chromatographic spectra of grain proteins with inhibitors yield information on component composition, isoelectric points and molecular weights of the inhibitors. The use of these methods makes it easy to distinguish the inhibitors in question without special purification. Figures 7; references 23: 16 Russian, 7 Western. [1748-6508]

UDC 577.150.3

DETERMINATION OF PHOSPHOLIPASE A_2 AND LYSOPHOSPHOLIPASE A_1 IN MIXTURES

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 21, No 1, Jan-Feb 85 (manuscript received 22 Apr 83) pp 122-128

TUYCHIBAYEV, M. U., MUKSIMOV, F. A., YAKUBOV, I., RAKHIMOV, M. M. and TASHMUKHAMEDOV, B. A., Institute of Biochemistry, Uzbek SSR Academy of Sciences, Tashkent

[Abstract] Venoms have been widely used to solve theoretical and applied problems related to the functions and structures of biological membranes. This article presents data showing that methods based on the action of phospholipase on suspensions of egg yolk or phosphatidylcholine cannot yield quantitative estimates of phospholipase activity if lysophospholipase is present in the objects studied. If lysophospholipase is present, as it is in some

venoms, anomalous light-scattering curves are produced. However, the method can be a sensitive test for detection of the presence of lysophospholipase in venom and purified phospholipase preparations. Figures 5; references 12: 5 Russian, 7 Western.
[1748-6508]

UDC 577.15.024.547.458.88

IMMOBILIZATION OF PROTEOLYTIC COMPLEXES ON PECTIN-CONTAINING CARRIERS

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 21, No 1, Jan-Feb 85 (manuscript received 22 Apr 83) pp 58-62

MANAYEV, B. M., YAMSKOV, I. A., ASHUBAYEVA, Z. D. and DAVANKOV, V. A., Institute of Heteroorganic Compounds, USSR Academy of Sciences, Moscow; Institute of Organic Chemistry, Kirghiz SSR Academy of Sciences, Frunze

[Abstract] New types of carriers based on acid polysaccharide-pectin are suggested. Proteolytic pancreatin and protosubtilin complexes were immobilized to evaluate their prospects. The immobilized pancreatin is a promising preparation for splitting of racemic amino acids by stereoselective hydrolysis of such derivatives as esters and amides. The activity of the dissolved and immobilized proteolytic complexes was determined by the use of low-molecular-weight substrates. A linear variation in rate of the enzymatic process as a function of enzyme concentration was observed at the proper concentrations of substrate and enzyme. Immobilization was performed by ionic sorption, covalent bonding and coordination bonding. All sorbents tested were effective for immobilization of the enzymes, but the best properties were those of the carrier based on pectin, melamine and formaldehyde, which also had good physical and mechanical properties. Immobilization of pancreatin did not significantly change the temperature variation of activity of the immobilized preparations in comparison to native preparations. Immobilization of proteolytic complexes results in a significant increase in their thermal stability. Pectin-based carriers are thus promising for immobilization of enzymes. Figures 6; references 5: 3 Russian, 2 Western.
[1748-6508]

UDC 577.3

CHEMOLUMINESCENT CHARACTERISTICS OF UBIQUINONES

Moscow BIOFIZIKA in Russian Vol 30, No 1, Jan-Feb 85
(manuscript received 1 Aug 83; after revision 16 Apr 84) pp 5-9

NAUMOV, V. V. and KHRAPOVA, N. G., Institute of Chemical Physics, USSR Academy of Sciences, Moscow

[Abstract] The ubiquinones are natural antioxidants, free-radical oxidation inhibitors. The best studied and most widely used model for comparison of activities based on kinetic interpretation of experimental results is the process of initiated oxidation of ethyl benzene. This work uses this model to determine the antiradical activity of ubiquinones of various structures in order to answer the question of the influence of isoprenoid side-chain length on ubiquinone activity and to determine the activity of the cyclical form of ubiquinone--ubichromenol. Studies were performed by the chemiluminescent method with azodiisobutyronitrile as initiator. Ubichromenol is found to have only half the antiradical activity of ubiquinol, possibly a result of the fact that ubichromenol has one active oxy group, while ubiquinol has two. Ubiquinol radicals are highly active, capable of chain continuation reactions and making ubiquinol a weak antioxidant. By analogy with tocopherol it is suggested that the ubiquinols, as natural antioxidants, participate in the regulation of free radical oxidation processes of biological membrane lipids. Figures 3; references 13: 11 Russian, 2 Western.
[1741-6508]

DARK AND LIGHT INDUCED EPR SIGNALS OF INVERTEBRATE EYE OMOCHROMES

Moscow BIOFIZIKA in Russian Vol 30, No 1, Jan-Feb 85
(manuscript received 29 Dec 83; after revision 15 Mar 84) pp 10-12

DONTSOV, A. Ye., MORDVINTSEV, P. I. and LAPINA, V. A., Institute of Chemical Physics, USSR Academy of Sciences, Moscow

[Abstract] Omochromes are shielding pigments in the eyes of invertebrates. They are the end product of oxidation of tryptophan and protect the light-sensitive receptors from excess light. Omochromes have an inhibiting effect on the process of peroxide oxidation of lipids. This work discovers paramagnetism of omochromes for the first time. The omochromes were isolated from eyes

of invertebrates without preliminary adaptation to dark conditions. The omochromes of all species of animals studied had a dark EPR signal, which was recorded both at liquid nitrogen temperature and at room temperature. UV or visible light causes a reversible increase in the concentration of paramagnetic centers in the omochromes. Figures 3; references 9: 6 Russian, 3 Western.
[1741-6508]

COVALENT CROSS LINKING AND DESTRUCTION OF PROTEINS CAUSED BY OZONE

Moscow BIOFIZIKA in Russian Vol 30, No 1, Jan-Feb 85
(manuscript received 17 Feb 84) pp 18-22

IGNATENKO, A. V. and CHERENKEVICH, S. N., Belorussian State University imeni V. I. Lenin, Minsk

[Abstract] A study is presented of the mechanisms of covalent cross-linking of proteins exposed to ozone. The data indicate that ozone causes covalent intermolecular cross-linking of protein molecules. In addition to the free radical mechanism of formation of 3, 3, dityrosine, cross-linking of macromolecules occurs with the participation of free amino groups of proteins and products of oxidation of tyrosine groups. Figures 4; references 15: 8 Russian, 7 Western.
[1741-6508]

ELASTICITY OF LIPID BILAYER IN LONGITUDINAL UNILATERAL EXTENSION

Moscow BIOFIZIKA in Russian Vol 30, No 1, Jan-Feb 85
(manuscript received 27 Jan 84) pp 59-65

SHIMANE, Ch. and PASECHNIK, V. I., Physics Faculty, Moscow State University imeni M. V. Lomonosov

[Abstract] Bilayer lipid membranes from various lipids are used to demonstrate that measurement of the elastic properties at 20 to 200 Hz truly measures the elasticity of the bilayer in unilateral extension and that the elasticity is not equal to 0. Young's modulus is measured as $E_{10} = 2 \cdot 10^5 - 3 \cdot 10^7$ PC. The individual portions of the membrane retain constant area and the shape of the entire membrane is not static. Figures 5; references 9: 8 Russian, 1 Western.
[1741-6508]

RESISTANCE OF CERTAIN PROTEIN CHANNELS TO PROTEOLYTIC DEGRADATION

Moscow BIOFIZIKA in Russian Vol 30, No 1, Jan-Feb 85
(manuscript received 16 Jan 84; after revision 5 Mar 84) pp 79-81

KRASIL'NIKOV, O. V., TERNOVSKIY, V. I., SABIROV, R. Z. and
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[Abstract] An earlier work suggested trans-membrane orientation of melitin molecules for information of ion channels. Information is presented indicating a sharp decrease in toxin-induced conductivity upon addition of pronase from the trans side of the bilayer. Due to the importance of this conclusion, the authors undertook a study of the influence of proteolytic enzymes on the functioning of melitin and certain other channel-forming proteins in a bilayer. Bilipid membranes were formed of oxidized cholesterol. Latrotoxin, α-staphylotoxin and melitin were used in the studies. Although the proteases did not change the conductivity of toxin-induced channels, it is suggested that proteolysis leads to the formation of cation-anion selectivity of the channels. A regular decrease in cation-anion selectivity was observed with decreasing pH of the solution surrounding the membrane. Based on the chemical structure of melitin, the selectivity of the channels it forms in the acid pH range apparently results from the positively-charged groups of lysine and arginine. Cation selectivity at pH greater than 6.6 apparently results from carbonyl groups on the polypeptide chain having a negative charge, as was suggested for channels formed by gramicidin and certain polyene antibiotics. Figures 2; references 11: 6 Russian, 5 Western.
[1741-6508]

UDC 577.3

STUDY OF INFLUENCE OF ULTRASONIC CAVITATION ON MONOCULTURES OF ALGAE BY MEASUREMENT OF DELAYED FLUORESCENCE

Moscow BIOFIZIKA in Russian Vol 30, No 1, Jan-Feb 85
(manuscript received 12 Dec 83) pp 103-106

DIDENKO, Yu. T., ANIKIYEV, V. V., ILYICHEV, V. I., ZAKHARKOV, S. P. and CHEKMASOVA, N. M., Pacific Oceanologic Institute, Far Eastern Scientific Center, USSR Academy of Sciences.

[Abstract] Cavitation plays a vital role in processes of depolymerization, intramolecular transformation of macromolecules and destruction of plant, animal and bacterial cells by ultrasound. This work studies the influence of ultrasound power and concentration of cells in algae monocultures on the rate of cell breakdown. The method of measurement of delayed fluorescence was used, since it records only living, photosynthetically active cells. The kinetic order of magnitude of cell destruction was determined by studying the variation in initial rate of destruction as a function of initial concentration of cells in the suspension. The variation in the rate of cell breakdown as a function of acoustical power was also studied. Breakdown of Dunaliella specium began

at a power of 0.05 W. It is apparently possible to form cavitation bubbles even at this low power. The conditions of growing of the algae also influence their resistance in the cavitation field: cells grown in sea water without the addition of Goldberg's medium were broken down significantly more rapidly. Figures 3; references 10: 6 Russian, 4 Western.
[1741-6508]

MODEL OF CONSTANCY OF COLOR PERCEPTION FOR CONTINUOUS SPECTRAL FUNCTIONS

Moscow BIOFIZIKA in Russian Vol 30, No 1, Jan-Feb 85
(manuscript received 17 Jan 84) pp 112-117

NIKOLAYEV, P. P., Institute of Information Transmission Problems, USSR Academy of Sciences, Moscow

[Abstract] A trichromatic model of the constancy of color perception is suggested for scenes with a single light source. The light source is considered to be distant, point or diffuse. The visual system reaction to the stimulus is assumed trichromatic, each color signal characterized by an absolute spectral sensitivity. Algorithms for precise and approximate estimation of color parameters are presented. The form of spectral functions in the model is selected on the basis of two major considerations: on the strength of the satisfactory nature of the approximation of natural spectral curves and based on the correspondence of properties of the Gaussian curve to the requirements of the task. References 18: 6 Russian, 12 Western.
[1741-6508]

NONLINEAR AND PARAMETRIC RESONANCES IN HUMAN ORGANS OF SIGHT AND HEARING

Moscow BIOFIZIKA in Russian Vol 30, No 1, Jan-Feb 85 (manuscript received 11 Jan 83; after revision 17 Nov 83; after second revision 18 Jan 84) pp 129-132

PROKOP'YEV, V. Ye., Institute of Atmospheric Optics, Siberian Department, USSR Academy of Sciences, Tomsk

[Abstract] Nonlinear and parametric resonances arising in the first stages of signal processing in the organs of sight and hearing in man were studied at the qualitative level. Parametric equations are suggested for combination tones arising in the organ of hearing. Experimental data on nonlinear vision are used to suggest a cis-trans isomerization system of retinal chromophore groups. The most probably mechanism of nonlinear vision is two-photon absorption with subsequent isomerization of cis to transforms occurring as in single-photon absorption. Figures 4; references 17: 6 Russian, 11 Western.
[1741-6508]

ROLE OF RELAXATION PROPERTIES OF MUSCLES IN FORMATION OF MOVEMENTS

Moscow BIOFIZIKA in Russian Vol 30, No 1, Jan-Feb 85
(manuscript received 1 Feb 82; after revision 27 Dec 83) pp 145-148

BOGDANOV, V. A., Institute of Problems of Information Transmission, USSR Academy of Sciences, Moscow

[Abstract] The muscular force developed by a muscle is studied as a function of time during regulation of movement by constructing a one-dimensional model with memory describing the rheologic behavior of active muscle. Processes of relaxation in the muscle are studied theoretically by analysis of available experimental results. All of the relationships analyzed are found for the regulation of movement consisting of alternating contraction and relaxation of the muscles. Linearization achieving the condition K = const apparently provides acceptable accuracy for estimation of the influence of relaxation in continuous regulation. References 27: 12 Russian, 14 Western.
[1741-6508]

DELAYED LUMINESCENCE OF PHYCOBILINS IN CYANOBACTERIA AT -196°C

Moscow BIOFIZIKA in Russian Vol 30, No 1, Jan-Feb 85
(manuscript received 25 Feb 84) pp 162-164

KOVALEV, Yu. V. and KRASNOVSKY, A. A., Jr., Biology Faculty, Moscow State University imeni M. V. Lomonosov

[Abstract] Previous works by the authors have described delayed fluorescence and phosphorescence accompanying the activation of triplet states of chlorophyl in frozen leaves, algae cells, chloroplasts and their fragments. In this work, the low-temperature afterglow of phycobilins is found in cyanobacteria cells. The experiments utilized a seven-day culture of cyanobacteria Anabaena variabilis K grown at 25°C with illumination of 4500 lx. Luminescence measurements were performed on a phosphoroscope. The studies indicate that low-temperature-delayed fluorescence of phycobilins is a characteristic property of photosynthesizing organisms containing biliprotein. The data obtained also indicate that these organisms contain a short wave pigment sensitizer, the excited molecules of which can interact with phycobilins and chlorophyl. Figure 1; references 6: 3 Russian, 3 Western.
[1741-6508]

ABSENCE OF INFLUENCE OF STRONG PERMANENT MAGNETIC FIELD ON ISOLATED MEMBRANE PREPARATIONS OF Na,K-DEPENDENT ATPase

Moscow BIOFIZIKA in Russian Vol 30, No 1, Jan-Feb 85
(manuscript received 16 Mar 84) pp 171-173

SAVICH, M. L., NAZAROVA, N. M., RAYKHMAN, L. M. and KUZNETSOV, A. N., Scientific Research Institute for Biological Testing of Chemical Compounds, Kupavna (Moscow Oblast')

[Abstract] A study is made of the effect of a permenent magnetic field with an induction of 10 T on isolated membrane preparations of Na, K-dependent ox brain ATPase. The 10 T field was not found to have any influence on the Na, K-ATPase activity under any of the conditions tested. The insensitivity of isolated Na, K-ATPase preparations to permanent magnetic field even at great field strength may result from insufficient size of cooperative areas of membrane lipids in small lipoprotein vesicles. The data obtained can therefore only with caution be extended to larger membrane formations functioning in vivo. Figure 1; references: 5 Russian.
[1741-6508]

UDC 577.33+577.352.315

EFFECTS OF ANESTHETICS ON PORPHYRIN-SENSITIZED PHOTODAMAGE OF HUMAN ERYTHROCYTIC MEMBRANES

Minsk DOKLADY AKADEMII NAUK BSSR in Russian Vol 29, No 4, Apr 85
(manuscript received 19 Apr 84) pp 371-373

CHERNITSKIY, Ye. A., VADETSKAYA, T. N. and VOROBEY, A. V., Institute of Photobiology, Belorussian SSR Academy of Sciences

[Abstract] Since porphyrins exert their light-sensitizing effects on biological objects by reaction with their membranes, and since anesthetics readily react with lipid bilayers, an attempt was made to ascertain whether anesthetics may affect photooxidative processes in membranes. The test object consisted of human erythrocytic membranes sensitized with different porphyrins, and subsequently exposed to several anesthetics. Two positively-charged local anesthetics--sovcain and trimecain--potentiated the sensitizing effects of the porphyrins. However, such an effect was not obtained with a neutral local anesthetic (anestezin) or a systemic anesthetic (ethanol). Comparison of light and dark mechanisms indicated that the effects of sovcain and trimecain were not due to enhanced lipid peroxidation per se, but rather to photosensitization. It appears that the hydrophobic nature of the effective anesthetics led to their interaction with erythrocytic membrane, and their positive charge led to greater sensitization by binding the negatively charged porphyrins. Figures 1; references 7: 2 Russian, 5 Western.
[1835-12172]

UDC 577.352.2:577.352.332+547.963.4

ELECTROGENIC STAGES IN PHOTOCYCLE OF BACTERIORHODOPSIN ANALOGUES CONTAINING RETINAL DERIVATIVE RESIDUES

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 1, No 11, Nov 84
(manuscript received 6 Apr 84) pp 1125-1142

DRACHEV, A. L., DRACHEV, L. A., YEVSTIGNEYEVA, R. P.*, KAULEN, A. D., LAZAROVA, Ts. R., LAYKHTER, A. L.*, MITSNER, B. I.*, SKULACHEV, V. P., KHITRINA, L. V. and CHEKULAYEVA, L. N.**, Moscow State University imeni M. V. Lomonosov, Interfaculty Scientific-Research Problems Laboratory of Molecular Biology and Bioorganic Chemistry imeni A. N. Belozerskiy; *Moscow Institute of Fine Chemical Technology imeni M. V. Lomonosov; **Institute of Biological Physics, USSR Academy of Sciences, Pushchino, Moscow Oblast

[Abstract] This work dealt with comparative investigation of the kinetics of optic and electric photoresponses of bacteriorhodopsin (BR) analogues containing 5,6-epoxy-5,6-dihydro- (I), 4-methoxy- (II), 4-keto- (III), 4-hydroxy- (IV) and 3,4-didehydroretinal (V) radicals. It was shown that they undergo cyclic photoinduced conversions through short-wave M-intermediate compounds and during this process are capable of executing a light-sensitive charge transfer across the membrane. Long-wave intermediate compounds formed in case of I, IV and V retinals, while a minimum of two products with millisecond and minute-long formation times were obtained with III. All analogues showed a diminished yield of photocycle quantum yield. Photoelectric response to laser flash was characterized with three electrogenic phases for all cases studied: a negative one of less than 200 ms and two positive phases of micro and millisecond duration. Figures 5; references 44: 10 Russian (1 by Western authors), 34 Western (4 by Russian authors).
[1822-7813]

UDC 577.352.26

FORMATION OF BILAYER LIPID MEMBRANES FROM SUSPENSION OF BACTERIORHODOPSIN IN LIPID SOLUTIONS

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 1, No 11, Nov 84
(manuscript received 18 Jun 84) pp 1143-1150

MIRSKIY, V. M., SOKOLOV, V. S., MARKIN, V. S. and CHEKULAYEVA, L. N.*, Institute of Electrochemistry imeni A. N. Frumkin, USSR Academy of Sciences, Moscow; *Institute of Biological Physics, USSR Academy of Sciences, Pushchino, Moscow Oblast

[Abstract] Bamberg developed a method for preparation of bilayer lipid membranes (BLM) from bacteriorhodopsin (BR) in organic suspension. Present authors showed that during formation of BLM by a monolayer method, a transmembrane insertion of BR into BLM takes place without formation of "third water" type structures. In the present work BR suspension in azolectin-decane

solvent was studied using the above method along with investigation of the photoelectric characteristics of BR in BLM obtained from such suspension. Different results were obtained depending on the method used: "third water" structures were observed with the Muller-Rudin method but not with the Montal-Muller technique in which one monolayer had no BR. Both BLM's generated photocurrent. Light-induced changes in BLM conductivity led to estimation of EMF for BR being less than, or about, 200 mV. Figures 6; references 17: 6 Russian, 11 Western (3 by Russian authors).
[1822-7813]

UDC 577.352.3:577.352.465

FUNCTIONING MECHANISM OF PROTONCONDUCTING CHANNELS IN BIOMEMBRANES

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 1, No 11, Nov 84
(manuscript received 30 Dec 83) pp 1171-1178

TOMCHUK, P. M., PROTSENKO, N. A. and KRASNOGOLOVETS, V. V., Institute of Physics, UkSSR Academy of Sciences, Kiev

[Abstract] Systems of membrane bioenergy in mitochondria, in chloroplasts and bacteria have many common functions which contribute to various theories on energy transformation during oxidative and photosynthetic phosphorylation. One of the principal elements of these theories is the electrochemical potential of hydrogen ions convertible to other energy forms during proton shifts from one side of a membrane to another by a chain of H-bonds (proton channels). In the present study a mechanism was proposed for polaron-condensing charge transfer along a model channel. This mechanism considered the strong bond of charge carrier with longitudinal optical polarization vibrations (vibrations of chain protons on H-bonds) and the interaction of charge carrier with acoustic phonons through these optical vibrations. It was shown that the experimental values obtained from proton currents are consistent with the suggestion of the injectional nature of protons (or proton holes) entering the channel from aqueous medium. Figures 3; references 38: 11 Russian (2 by Western authors), 27 Western (2 by Russian authors).
[1822-7813]

UDC 579.24

BIOSYNTHESIS OF BIOLOGICALLY ACTIVE SUBSTANCES BY IMMOBILIZED CELLS OF MICROORGANISMS (REVIEW)

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 20, No 5, Sep-Oct 84 (manuscript received 5 Aug 83) pp 579-592

YEGOROV, N. S., LANDAU, N. S., BORMAN, Ye. A. and KOTOVA, I. B., Moscow State University

[Abstract] The authors present an analysis of the literature as well as their own research on the utilization of immobilized cells of microorganisms for synthesis of biologically active compounds. Topics covered include methods of immobilization of cells, the influence of immobilization on their vital activity, the biosynthesis of amino acids and certain other organic acids, the use of immobilized cells for biosynthesis of antibiotics and enzymes, and prospects for the use of immobilized cells. A table lists products, microorganisms, relative activity of microorganisms and half life periods. Immobilized microorganism cells can be used not only for single-stage reactions, but also for complex biosynthesis processes involving multiple-enzyme complexes. The possibility of organizing continuous processes opens broad prospects for the use of biocatalysts in microbiology. Immobilized cells can be used not only for the production of valuable organic substances, but also to break down toxic compounds in purification of waste waters, as well as biophotolysis of water and nitrification. Future studies will solve the problems of biosynthesis of antibiotics, enzymes and other complex biologically active substances using immobilized microorganism cells. Figure 1; references 69: 44 Russian, 25 Western.
[1591-6508]

UDC 576.809.5.43:622.33

MICROBIOLOGICAL OXIDATION OF METHANE IN COAL UNDER VARIOUS AERATION CONDITIONS

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 20, No 5, Sep-Oct 84 (manuscript received 9 Mar 83) pp 641-647

NESTEROV, A. I., STAROVOYTOVA, G. A., BONDAR', V. A., ZYAKUN, A. M. and IVANOV, M. V., Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino

[Abstract] The microbiological method of decreasing the methane content in coal seams, based on microbiological oxidation of methane in the pores of the coal, is an important use for methane-oxidizing bacteria. The purpose of this article is to determine the variation in effectiveness of microbiological oxidation of methane in coal as a function of pressure of air in the pore space under conditions modeling the technology of microbiological reduction of the methane content of coal seams. Experiments were performed with a culture of methane-oxidizing bacteria Methylosinus trichosporium. A core of coal 80 mm long and 60 mm in diameter was placed in a rubber jacket within a metal core holder and compressed under water pressure around the jacket. Pressure was maintained at 100 atm. The core was saturated with methane 20 m^3/T and a suspension of methane-oxidizing bacteria was forced in until the pore space was saturated with microorganisms. The study showed that under the modeling conditions the decrease in gas content of coal seams due to oxidization of methane by microorganisms is accompanied by a proportional change in the isotope composition of the carbon of the coal departing from the methane. This allowed isotope mass spectrometry to be used to determine the rate of microbiological oxidation of the methane at various air pressures. The intensity of the process was found to decrease by a factor of four with an increase in air pressure from 40 to 90 atm, a result of the inhibiting effect of the partial pressure of oxygen. Figures 4; references 7: 6 Russian, 1 Western.
[1591-6508]

UDC 576.851.1:663.1+557.156

ESTIMATE OF DIGESTIBILITY OF BIOMASS OF METHANE-OXIDIZING BACTERIA

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 20, No 5, Sep-Oct 84 (manuscript received 10 Jun 83) pp 648-652

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[Abstract] Microbiological synthesis of protein is an effective means of increasing dietary protein. Methane-oxidizing bacteria, which can utilize methane as a source of carbon and energy, are of great interest for the production of protein. A study is presented in this article of the digestibility of the biomass of two types of methane-oxidizing bacteria, with intracytoplasmic membranes located in the central portion (type I) and peripheral portion (type II) of the cell. Studies were performed with eight species of obligate

methanotrophic bacteria. Digestibility was calculated as the ratio of dissolved nitrogen to total nitrogen of the biomass after treatment by proteolytic enzymes, in percent. The results of the experiments indicate that type I bacteria are most promising for commercial cultivation, their biomass being 85 to 95% hydrolyzed. The digestibility of all types of bacteria was greater during the exponential growth phase than in the later study growth phase. Figure 1, references 13: 8 Russian, 5 Western.
[1591-6508]

UDC 576.8.098

METHOD OF DETERMINING ACTIVITY OF ENTOMOPATHOGENIC CRYSTAL-FORMING PROTEIN OF BACILLUS THURINGIENSIS

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 20, No 5, Sep-Oct 84 (manuscript received 19 Apr 82) pp 682-687

MIKHAYLOVA, A. L., KLEPIKOVA, F. S., CHESTUKHINA, G. G. and STEPANOV, V. M., All-Union Scientific Research Institute of Genetics and Selection of Commercial Microorganisms, Moscow

[Abstract] The authors have developed a method for determining the activity of entomopathogenic protein produced by B. Thuringiensis based on recording of a decrease in weight gain of caterpillars receiving the toxin with their food. The method can be used to determine the activity of crystals and solutions of the δ-endotoxin as well as products of its proteolytic degradation. Pure crystals of δ-endotoxin were suspended in NaOH and left for 45 minutes at room temperature with constant agitation. The insoluble portion of the crystals was removed by centrifugation, 0.1 M Hcl was added to the supernatant fluid to pH 9.0-9.5. The development of the method suggested for determining biological activity of the δ-endotoxin required primarily selection of the optimal conditions for observation of feeding of the caterpillars to determine variations in weight gain as a function of quantity of toxin present. The method is more sensitive than the traditional method of observing lethality, requires a relatively small number of caterpillars, yields reproducible results and can be used to determine the activity of crystalline protein preparations and products of their hydrolysis. Figures 3; references 26: 3 Russian, 23 Western.
[1591-6508]

UDC 576.311.1

INTERACTION OF ERYTHROCYTES WITH AMINOALKYL AGAROSE

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 20, No 5, Sep-Oct 84 (manuscript received 7 Jan 83) pp 688-693

POLTORAK, A. N., MARTYUSHIN, S. V. and PASECHNIK, V. A., All-Union Scientific Research Institute of Especially Pure Biopreparations, Leningrad

[Abstract] A study is made of the process of the immobilization of erythrocytes on aminoalkyl agarose. Erythrocytes were interacted with adsorbent in columns filled with aminoalkyl agarose. The mechanism of interaction of the erythrocytes and adsorbent was studied. Fresh chick erythrocytes were washed to remove formed blood elements at 1,000 g, then triple-centrifuged at 2,000 g in 0.01 M phosphate buffer, pH 6.8, containing 0.145 M sodium chloride. Sorption of erythrocytes was performed in columns with aminoalkyl agarose at 4°C balanced by phosphate buffer pH 6.8. The quantity of adsorbed erythrocytes was determined by the difference between the number of erythrocytes put in and the number eluted by washing phosphate buffer. It was found that erythrocytes are effectively bonded with aminoalkyl agarose, the process of adsorption is characterized by positive cooperation. Cooperation is found to be a function of the length of the aminoalkyl spacer. Increasing spacer length results in an increase in concentration of immobilized erythrocytes. The data indicate effectiveness of the use of such adsorbents for immobilization of erythrocytes. Figures 4; references 17: 2 Russian, 15 Western.
[1591-6508]

UDC 677.4.614.485

INFLUENCE OF GAMMA RADIATION ON IMMOBILIZED TRYPSIN

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 20, No 5, Sep-Oct 84 (manuscript received 21 Dec 82) pp 694-698

RYL'TSEV, V. V., VLASOV, L. G., SAMOYLOVA, T. I., VOLKOVINSKAYA, L. P., BONDAREVA, L. N., ZAZHIREY, V. D., NETREBENKO, S. V. and KHACHIYANTS, V. I., All-Union Scientific Research Institute of the Textile and Haberdashery Industry, Moscow; All-Union Scientific Research Institute of Technology of Blood Substitutes and Hormonal Preparations, Moscow

[Abstract] Textile materials with immobilized proteolytic enzymes can be widely used in medicine for the treatment of purulent wounds, trophic ulcers, bed sores, etc. The purpose of this work was to study the variation in sterility of textile materials with immobilized trypsin as a function of ionizing radiation dose, as well as the influence of radiation sterilization on the proteolytic activity of the immobilized trypsin. Specimens of medical gauze carrying immobilized trypsin were infected with an experimental culture of staphylococcus strain 1726, irradiated and washed repeatedly with sterile isotonic saline solution and attempts were made to cultivate the staphylococcus

from the specimens on meat-peptone agar. The studies showed that trypsin immobilized on a textile matrix has high radiation sensitivity in the air-dry state. The radiation dose can be quite low for sterilization of the trypsin. Figures 2; references 10: 6 Russian, 4 Western.
[1591-6508]

UDC 615.31:547.466

PRODUCTION OF PROTEIN HYDROLYSATES WITH ASSIGNED PROPERTIES (REVIEW)

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 21, No 1, Jan-Feb 85 (manuscript received 24 Aug 83) pp 3-17

NEKLYUDOV, A. D. and NAVASHIN, S. M., All-Union Scientific Research Institute of Antibiotics, Moscow

[Abstract] The task of directed hydrolysis of protein and production of protein hydrolysates with predetermined properties designed for various purposes, including medical therapy, is an important one. Multicomponent mixtures of individual amino acids are best for parenteral protein nutrition. This review of the literature analyses methods for production of protein hydrolysates with properties assigned in advance, demonstrating that yeast proteins of various types can be used for the purpose of addition to the widely used nutrient proteins. The major methods of protein hydrolysis are described, including acid hydrolysis and enzymatic hydrolysis with free or fixed enzymes. Methods of purification of protein hydrolysates and yeast hydrolysates are discussed. It is concluded that it is genuinely possible at the present time to produce protein hydrolysates from animal and microbiological raw materials with predetermined properties. The hydrolysates can be used for widely varied purposes, including parenteral nutrition. References 125: 73 Russian, 52 Western.
[1748-6508]

UDC 577.15.07+543:544

SORBENTS WITH GROUP SPECIFICITY WITH IMMOBILIZED DYES FOR PURIFICATION OF YEAST ALCOHOL DEHYDROGENASE

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 21, No 1, Jan-Feb 85 (manuscript received 25 Apr 83) pp 25-34

FLAKSAYTE, S. S., SUDZHYUVENE, O. F., PESLYAKAS, I.-G. I. and GLEMZHA, A. A., All-Union Scientific Research Institute of Applied Enzymology, Vilnius

[Abstract] Results are presented from studies of the interaction of a number of domestic active dyes with yeast alcohol dehydrogenase (ADH) by differential spectroscopy and chromatography in order to determine active dyes suitable as ligands for group specificity sorbents for NAD-dependent dehydrogenases. The active dye cibacron blue F3GA from West Germany and domestic monochloro, dichlorotriazine and vinyl sulfone series dyes were used. The dichlorotriazine

dyes were first subjected to alkaline hydrolysis in 1.5-2 times excess of 0.1 N NaOH at room temperature for eighteen hours to avoid covalent attachment to enzymes. All dyes in the presence of ADH have characteristic differential absorption maxima shifted in comparison to the absorption maxima of the dyes by 20 to 75 nm toward the long wave and of the spectrum. The results of differential spectrophotometric titration of yeast ADH with active dyes indicates that in addition to cibacron blue, active domestic dyes can also be used as ligands for yeast ADH. Figures 6; references 21: 1 Russian, 20 Western. [1748-6508]

UDC 577.15.062:547.466

IMMOBILIZATION OF CELLS OF BACTERIUM CITROBACTER FREUNDII WITH TYROSINE-PHENOL-LYASE ACTIVITY IN POLYACRYLAMIDE GEL

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 21, No 1, Jan-Feb 85 (manuscript received 28 Mar 83) pp 41-47

TYSYACHNAYA, I. V., YUNAK, Ye. V., VOYVODOV, K. I., GUBNITSKIY, L. S., YAKOVLEVA, V. I. and BEREZIN, I. V., Moscow State University

[Abstract] The preparation of various products by means of biocatalysts is an intensively developing area of biotechnology. The purpose of the present study is to develop conditions of immobilization of citrobacter freundii cells in polyacrylamide gel (PAAG) and to examine the possibility of using immobilized cells for the synthesis of L-tyrosine. The basis of immobilization of the cells with TPL activity by inclusion in PAAG is a method developed earlier for inclusion of E. coli cells in this same gel. In the presence of various enzymatic activity stabilizers including substrates and synthesis products of L-tyrosine and L-DOPA, immobilization in the presence of ammonium sulfate retains 60-70% of the TPL activity, immobilizing 70-90% of the protein present in the cells. Figures 5; references 17: 14 Russian, 3 Western. [1748-6508]

UDC 547.965.613.292

ENZYMES FOR STUDY OF PROTEIN HYDROLYSATES AND MIXTURES OF AMINO ACIDS CONTAINING NO PEPTIDES

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 21, No 1, Jan-Feb 85 (manuscript received 13 Apr 83) pp 48-57

KREST'YANOVA, I. N., VASIL'YEVA, L. I., DENYAKINA, Ye. K., PETROVA, L. I., PENZIKOVA, G. A., BARTOSHEVICH, Yu. E. and NEKLYUDOV, A. D., All-Union Scientific Research Institute of Antibiotics, Moscow

[Abstract] The purpose of this work was to produce protein hydrolysates with a varying ratio of free amino acids and peptides by means of proteolytic preparations consisting of alkaline and neutral proteases and of a peptidase preparation containing enzymes with carboxy-, leucine, di-, tri- and tetrapeptidase activity. Hydrolysis of proteins in the presence of the preparation,

called 'S,' can produce hydrolysates containing from 13-18% free amino acids, subsequent processing of which with peptidases leads either to exhaustive hydrolysis of the remaining peptide fractions or production of solutions containing 60-85% free amino acids and low-molecular-mass peptides. The preparation 'S' hydrolyses both free molecular protein substrates and various low-molecular-weight compounds. The hydrolysates produced can be used as nitrogenous preparations for enteral nutrition, but require special enrichment with free amino acids for use in parenteral nutrition preparations. Successive utilization of the two enzyme preparations, 'S' and peptidase, can thus produce both protein hydrolysates with varying ratios of free amino acids and peptides and mixtures of amino acids containing no peptides, suitable for use in medical practice. References 32: 22 Russian, 10 Western.
[1748-6508]

UDC 576.809.51

ISOTOPE CHARACTERISTICS OF METHANE PRODUCED BY THERMOPHILIC METHANOL FERMENTATION BY A SYMBIOTROPHIC CULTURE

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 21, No 1, Jan-Feb 85 (manuscript received 16 Jun 83) pp 80-84

LEBEDEV, V. S. and PANTSKHAVA, Ye. S., All-Union Scientific Research Institute of Nuclear Geophysics and Geochemistry, Moscow; Institute of Biochemistry imeni A. N. Bakh, USSR Academy of Sciences, Moscow

[Abstract] The progressive fossil fuel shortage requires study of bacterial methanogenesis to find processes for formation of hydrocarbons and determine the significance of methane-producing bacteria in the formation of gases in sedimentary deposits, to clarify the conditions of formation of oil and gas deposits. This article studies the isotope composition of the carbon in methane generated by a symbiotrophic culture of Methanobacillus kuzneceovii fermenting methyl alcohol at 56°C in a 10 liter fermenter on a medium containing 2 G NH_4Cl, 3.6 G $K_2HPO_4 \cdot 3H_3O$, 2.8 G KH_2PO_4, 0.3 G $MgCl_2 \cdot 7H_2O$, 0.15 G $Na_2S \cdot 9H_2O$, 0.04 G $FeSO_4 \cdot 7H_2O$ and 5 ml CH_3OH in each liter of tap water. Oxygen-free argon was blown through the fermentation medium after inoculation. Specimens for analysis were collected throughout the process by means of bubblers connected in series to the gas exhaust system. Samples were analyzed chromatographically. The isotope composition of the carbon was determined on a mass spectrometer by the relative compensation method. The isotope characteristics of the methane formed indicated a two-stage nature of processes of fermentation. During the initial stage of the process, more isotope-light methane was produced. As methanol was consumed, the concentration of ^{13}C increased in the methane produced. After complete consumption of the methanol, the first stage in the process ends and methane is subsequently formed by fermentation of acetate synthesized in the first stage. During the first stages of consumption of acetate, methane with low ^{13}C content is formed, the concentration of ^{13}C-methane increasing as the acetate is consumed. References 10: 5 Russian, 5 Western.
[1748-6508]

UDC 574.5

NITROGEN FIXATION CONDITIONS IN DRUKSHYAY LAKE BEFORE STARTUP OF IGNALINA NUCLEAR POWER PLANT

Vilnius TRUDY AKADEMII NAUK LITOVSKOY SSR, SERIYA V: BIOLOGICHESKIYE NAUKI in Russian No 4(88), Oct-Nov-Dec 84 (manuscript received 7 Dec 83) pp 111-116

PASHKAUSKAS, R. A., Institute of Botany, Lithuanian SSR Academy of Sciences

[Abstract] A seasonal study is presented of the process of fixation of N_2 and factors determining the activity of certain groups of nitrogen-fixing microorganisms in Lake Drukshyay before startup of the Ignalina nuclear power plant. Specimens for analysis were taken in soils and in the water at two permanent stations, one in a deep portion of the lake, 33 m deep, one in an inlet with depth of 6 m. Water temperatures, dissolved oxygen and ammonia nitrogen were determined. The population of methylotrophs was determined, as was the intensity of nitrogen fixation. The process of nitrogen fixation was most active in 1982 in June-July (up to 2 μg N/l·day). In late summer, after a sharp decrease in the quantity of cyanobacteria, the activity of the process reached its minimum. Clostridium butyricum is important in fixation of N_2 in the soil both during summer and winter. The greatest number of methylotrophs is found in zones with minimum oxygen concentration summer and winter. Methylotrophs have nitrogen fixing activity. Nitrogen fixing activity in this lake varies significantly from year to year. Figures 5; references 12: 9 Russian, 3 Western. [1053-6508]

UDC 613.633:628.511.4

ELECTROSTATIC PURIFICATION OF AIR IN THE WORKPLACE TO REMOVE FINELY DISPERSED AEROSOLS

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 12, Dec 84 (manuscript received 29 Dec 83) pp 27-29

POGOZHEV, S. V., Kuybyshev Autotractor Electric Equipment and Carburetor Plant; Scientific Research Institute of Coal, Krasnoyarsk.

[Abstract] The use of fine fiber filters for air cleaning purposes deionizes the air, which has an unfavorable influence on workers. The filters themselves may also pollute the air with aerosols. The use of electroeffluvial air ionizers and artificial air ionization devices of other types for production areas has been recommended by the health ministry. This work presents a study of the possibility of using electroeffluvial air ionizers to cleanse the air of finely dispersed aerosols under production conditions. A modification of an ionizer consisting of a full dielectric unit with inlet and outlet apertures, an air heater, unipolar-negative corona and precipitating electrodes with high voltage power supply has been suggested for the purpose. The operation of the device is described. Operation of the unit for one hour caused a decrease in bacterial content, reduction in dust content to below the sensitivity of the test device, a decrease in oxidizability of the air and an increase in light ion content with a simultaneous decrease in heavy ion content. References 6 Russian.
[1743-6508]

UDC 502.5:630.18(476)

EFFECT OF INDUSTRIAL EMISSIONS ON CHEMICAL COMPOSITION OF GROWING STOCK OF CONIFEROUS PHYTOCOENOSES

Minsk DOKLADY AKADEMII NAUK BSSR in Russian Vol 29, No 3, Mar 85 (manuscript received 30 Mar 84) pp 271-274

SIDOROVICH, Ye. A., RUPASOVA, Zh. A. and BUS'KO, Ye. G., Central Botanical Garden, BSSR Academy of Sciences

[Abstract] The levels of several metals and sulfur were determined in the growing stock of coniferous trees: pines and spruce, because they represent typical contaminations from industrial and urbanized environment. Three groups were identified among the elements studied: Ca (4300--7200 mg/kg in needles,

bark and roots, 300--600 mg/kg in trunks); Al, Mg, S (500--3000 mg/kg and 20--600 mg/kg respectively) and all other elements whose content was by 1--2 orders of magnitude lower. Comparative analysis with control showed that, as a result of environmental pollution, the following elements exceeded their normal levels in needles, bark and roots: Ca, Na and Ni; the accumulation of Al, Fe and Zn was reduced. References 7: 5 Russian, 2 Western.
[1816-7813]

UDC 581.5+628.34+502.7

TOTAL SULFUR CONTENT IN PINE NEEDLES AS A DIAGNOSTIC TEST OF POLLUTION IN EMISSION-POLLUTED AREAS

Minsk DOKLADY AKADEMII NAUK BSSR in Russian Vol 29, No 3, Mar 85
(manuscript received 10 Apr 84) pp 275-277

BOYKO, A. V., CHUBANOV, K. D., SUROVAYA, T. P. and KISELEV, V. N., Central Botanical Garden, BSSR Academy of Sciences

[Abstract] The total sulfur content was determined in pine needles from the forests near large industrial cities like Minsk, Svetlogorsk and Mozyrsk Petroleum Processing Plant and compared to data from Volozhinsk and Oktyabr'sk forests located at least 50 km from such industrial centers. The highest levels of sulfur were found in material from Svetlogorsk and Mozyrsk, those from around Minsk were between the high and control values. Even though currently these levels were not high enough to injure the trees, latent effect could not be excluded resulting from long lasting exposure to SO_2 gas even at moderate or low concentrations. References 12: 3 Russian (1 by Western author), 9 Western.
[1816-7813]

UDC 599.323.4:616.9-036

HABITATION OF BANKS OF RECLAMATION CANALS BY MOUSE-LIKE RODENTS AND PROBLEM OF TULAREMIA IN DRAINED AREAS

Minsk VESTSI AKADEMII NAVUK BSSR: SERIYA BIYALAHICHNYKH NAVUK in Russian No 1, Jan-Feb 85 (manuscript received 4 Apr 84) pp 113-115

SAVITSKIY, B. P. and PADUTOV, Ye. Ye., Gomel' State University

[Abstract] As a part of a combined study entitled 'The Fauna of Poles'ye', the authors analyzed population of the banks of land reclamation drainage canals by mouse-like rodents as possible participants in the circulation of the tularemia pathogen in Poles'ye. Studies were performed at 'Komsomol'skiy' State Farm and adjacent areas of Gomel' Oblast' in 1976-1981. In 44,100 trap-days, 704 mouse-like rodents were caught. Five species of rodents were found, the field mouse being dominant. Along canal banks passing through undrained areas the population of mouse-like rodents is extremely low. The population is much higher in areas which have been drained. The field mouse and water vole are highly susceptible to the tularemia pathogen. Their presence on the banks of canals used for agricultural production is a great danger in terms of the possibility of forming tularemia foci. References: 7 Russian.
[1052-6508]

FOOD TECHNOLOGY

MARICULTURE HAS COME OF AGE

Moscow PRAVDA in Russian 8 Apr 85 p 7

ZHIRMUNSKIY, A., director, Institute of Marine Biology, Far Eastern Scientific Center, USSR Academy of Sciences, corresponding member, USSR Academy of Sciences, and TROFIMENKO, B., general director, "Primorrybprom" Association, Vladivostok

[Abstract] With exploitation of the natural marine resources having virtually reached its limits in the biological sphere, mariculture has acquired new importance and meaning. One of its key advantages is that it allows for complete control over the productive bioprocess and is a relatively cost-effective undertaking. However, mariculture must not be understood to be limited to the production of foodstuffs for human consumption, but also as a means of culturing marine and aquatic life in general as a source of feed for domestic animals and of raw materials for other industrial processes, including the pharmaceutical industry. Soviet scientists have taken a leading role in the development of mariculture, with the Pacific Scientific Research Institute of Fisheries and Oceanography recognized as being especially prominent in basic and applied research in mariculture. On the orders of the USSR Ministry of Fisheries, the Institute has prepared a multifaceted program for the further development of mariculture in the Soviet Far East on a cooperative basis with other institutions.
[307-12172]

OZONE STERILIZATION OF REFRIGERATION CHAMBERS

Kishinev IZVESTIYA AKADEMII NAUK MOLDAVSKOY SSR: SERIYA BIOLOGICHESKIKH I KHIMICHESKIKH NAUK in Russian No 1, Jan-Feb 85 (manuscript received 19 Jun 84) p 77

VORONIN, M. I., ZHUCHENKO, E. V., FURSOV, S. P., KOGAN, E. D. and MARZHINA,L.A.

[Abstract] Trials were conducted on the effectiveness of ozone in the sterilization of refrigeration chambers 14-16 m^3 in size. Ozone concentrations of 2-20 mg/m^3 for 1 h were found effective in suppressing mold growth on walls over a temperature range of -1 to 14°C. The effects of ozone were humidity-dependent, with loss of effectiveness when the relative humidity approached 95%. References: 3 Russian.
[1060-12172]

UDC 575.153:[633.111+581.145]

EFFECT OF FOREIGN CYTOPLASMS ON FORMATION OF MALE GENERATIVE SPHERE IN ALLOPLASMIC LINES OF SOFT WHEAT

Minsk DOKLADY AKADEMII NAUK BSSR in Russian Vol 29, No 3, Mar 85
(manuscript received 17 Apr 84) pp 278-280

SILKOVA, T. A. and PALILOVA, A. N., Institute of Genetics and Cytology, BSSR Academy of Sciences

[Abstract] The relationship between line genotype, alien cytoplasm and medium factors in forming male reproductive sphere in alloplasmic forms has not been adequately studied. Therefore the frequency of the occurrence of altered pollens and seed setting rate during selfpollination of alloplasmic lines of soft wheat with nuclear genoms from Chinese spring and Penjamo 62 brands along with various types of Aegilops cytoplasms (Aegilops juvenalis, Ae. crassa, Ae. vavilonii and Ae. sharonensis) was investigated. Although an inhibitory effect of these cytoplasms on development of anthers was noted, it was not uniform. Evidently, the nuclear-cytoplasmic reactions of the genom with studied cytoplasms are also sensitive to other factors such as temperature, photoperiodicity, daylight, etc., resulting in changes of biochemical processes. Figure 1; references 7: 2 Russian, 5 Western.
[1816-7813]

UDC 616.24-006.6-085:277.3

LASER IRRADIATION AS CONTEMPORARY METHOD IN TREATMENT OF ONCOLOGIC DISEASES

Moscow SOVETSKAYA MEDITSINA in Russian No 2, Feb 85
(manuscript received 16 May 84) pp 92-96

PLETNEV, S. D., CHISSOV, V. I. and KARPENKO, O. M., Moscow Scientific Research Institute of Oncology imeni P. A. Gertsen

[Abstract] Studies of the technology of laser radiation began at the Moscow Scientific Research Institute of Oncology imeni P. A. Gertsen in 1965 in two general areas; development and improvement of equipment for medical applications and application of laser beams in surgical interventions, especially in oncology. These studies showed that gas lasers are quite suitable for medical purposes, especially those based on CO_2 source. In comparison to other cutting instruments, laser beams are characterized by low hemorrhaging, aseptic conditions in the field of cutting, excellent healing and rapid regeneration of blood vessels in the operating zone. Further developments in miniaturization of the delivery system for laser beams (flexible fiber optic cables) will make it possible to deliver the energy to vital internal organs for surgical application.
[1837-7813]

LASER IN MEDICINE

Alma Ata KAZAKHSTANSKAYA PRAVDA in Russian 16 Apr 85 p 3

KRIVOBOKOV, E., correspondent, Alma-Ata

[Abstract] With the ever-increasing implementation of laser technology in surgery, ophthalmology, dermatology, cardiology and other branches of medicine, the time has come to deal with the more mundane problems pertaining to this new medical technology. One aspect concerns the availability of top-quality medical equipment and instruments, and the responsibilities of the Soviet medical instrumentation industry in meeting the ever-increasing demands. Soviet engineers and machinists are hard at work to provide the best instrumentation possible, meeting the highest standards of safety and reliability. Another important aspect pertains to special training that physicians wishing to specialize in this field must have, and the development of criteria of certification. The Kazakh SSR Minister of Health, M. A. Aliyev, has promised

encouragement and support for individuals with an inclination to go into this specialty. Unfortunately, all too often, it has been a case of enthusiasts working under adverse conditions and with a lack of adequate understanding from top management in the medical sector that have made the most progress in laser medicine. But such days appear to be over, and we can see a new era for laser medicine in Kazakhstan.
[306-12172]

UDC 621.373.826:617.7

USE OF PLANE NON-AXIALLY-SYMMETRIC FOCUSERS IN LASER OPHTHALMOSURGERY

Moscow KVANTOVAYA ELEKTRONIKA in Russian Vol 12, No 2, Feb 85
(manuscript received 25 Jul 84) pp 401-402

AKOPYAN, V. S., DANILEYKO, Yu. K., DANILOV, V. A., NAUMIDI, L. P., POPOV, V. V. and SISAKYAN, I. N., Institute of General Physics, USSR Academy of Sciences, Moscow

[Abstract] Plane focusers which ensure formation of non-axially symmetric distribution of CO_2-laser intensity are being used in ophthalmosurgery. A continuous action, single mode, CO_2 laser with radiation intensity up to 30 W was used to test focusing of optical elements which ensure successful performance of crucial coagulation of the cornea, ring coagulation of the cornea, ring coagulation analogous to trephining of the cornea, half-ring coagulation as is done in cataract removal and coagulation in an area bounded by a rectangle and coagulation of the cornea and sclera in various combinations of multiple points. It was possible to obtain transverse dimensions of coagulation lines which do not exceed 200 μm at an incision depth of half of the cornea thickness. The burn zone, with transverse dimensions up to 1 mm, was indiscernible within several days after the procedure. This study did not involve consideration of the fundamental aspects of interaction of laser emission and biological tissue. Figure 1; references 4: 2 Russian, 2 Western.
[298-2791]

UDC 616.12-009.86-057-085.217.24+615.214.22

TREATMENT OF VEGETOVASCULAR DYSTONIA WITH β-BLOCKS AND TRANQUILIZERS

Moscow SOVETSKAYA MEDITSINA in Russian No 3, Mar 85
(manuscript received 17 Apr 84) pp 83-85

ZUBAREV, Yu. G. and KULAKOV, S. A., Baltic Central Basin Hospital imeni G. I. Chudnovskiy (Chief physician--candidate of medical sciences V. A. Shelukhin), Leningrad

[Abstract] Intensified navigational operations lead currently to much greater demands being placed on the bodies of seamen and on their emotional state. Many of them develop vegetovascular dystonia syndrome (VDS). This appears to be due to excessive activity of central adrenergic mechanisms responsible for integration of emotional motor and vegetative functions. Vegeto-vascular reaction was studied by clinical-psychological methods on 160 men and 100 women, all members of passenger ship crews, aged 20-42 years. The duration of sea voyage lasted 15-30 days in north European and Cuban seas with short stopovers in various ports. Evaluation of vegetative adequacy was made on the basis of clinical symptoms of tonus predominance and on reactivity of autonomous nerve system components: pulse rate, arterial pressure, dilation of pupils, intensity of salivation and sweating, intestinal peristalsis, dermographism and ortho-clinostatic and ocular-cardiac reflexes. Various symptoms were treated with β-blocks and with tranquilizers showing that low doses of these combined drugs rapidly counteracted the vegetative dysfunctions and could be used prophylactically to prevent development of neurotic states and hypertension diseases of seamen. References 9: 7 Russian, 2 Western.
[1838-7813]

UDC 617.55-089.8-7:621.375.826

LASER SURGERY ON ABDOMINAL ORGANS

Leningrad VESTNIK KHIRURGII IMENI I. I. GREKOVA in Russian No 3, Mar 85
(manuscript received 13 Apr 84) pp 45-48

KOSHELEV, V. N. and CHALYK, Yu. V., Chair of Elective Surgery, Pedagogy Faculty, Saratov Medical Institute

[Abstract] A clinical trial was conducted with different modalities of CO_2 laser (20 W, 10.6 μm) used in surgery in hepatic, pancreatic and splenic surgery.

Analysis of the results obtained for 156 patients demonstrated that both focused and defocused modalities have their specific indications, depending on the condition and purpose. A focused Romashka or Skal'pel'-1 beam is used for sectioning, while defocused beams are used for coagulative and hemostatic effects. As indicated, both may be used in combination as required for the operation and the type of tissue involved. The outcome of the procedures was good, with only one fatality involving hepatorrhexis. References 9: 7 Russian, 2 Western.
[1061-12172]

UDC 616-001.4-002..3-089-7:621.375.826

HELIUM-NEON LASER TREATMENT OF PYOGENIC WOUNDS

Leningrad VESTNIK KHIRURGII IMENI I. I. GREKOVA in Russian No 3, Mar 85 (manuscript received 2 Jan 84) pp 57-60

GOSTISHCHEV, V. K., VERT'YANOV, V. A., SHCHUR, V. V., KHANIN, A. G., NOVOCHENKO, A. N. and MAMEDOV, E. I., Chair of General Surgery, Therapeutics Faculty, First Moscow Medical Institute imeni I. M. Sechenov

[Abstract] Clinical trials were conducted on 274 patients, 16-78 years of age, to determine the effectiveness of helium-neon lasers (632.8 nm, 2 mW) in the treatment of pyogenic wounds. Laser therapy was instituted within 1 h of surgical treatment and consisted of 10-15 irradiations with a 4.5 J dose. Marked objective and subjective improvement was noted in 70% of the patients after 3-5 laser treatments, with alleviation of pain, edema and hyperemia. Discharge was significantly reduced after 6-9 procedures. The mean duration of hospitalization of the experimental group was 15.9 days, as opposed to 21.5 days for a control group treated in a conventional manner that excluded laser therapy. On the whole, helium-neon laser therapy facilitated earlier elimination of necrotic tissue and onset of granulation, and resulted in reduction of bacterial contamination. However, the pathogenic characteristics of the bacterial isolates were not affected. Helium-neon laser therapy has, therefore, been shown to be a valuable adjunct in the management of pyogenic wounds, devoid of discernible complications. References: 7 Russian.
[1061-12172]

UDC 617-001.17-08:615.831

INFRARED RADIATION TREATMENT OF BURN PATIENTS IN ISOLATION WARDS

Leningrad VESTNIK KHIRURGII IMENI I. I. GREKOVA in Russian No 3, Mar 85 (manuscript received 16 Aug 84) pp 74-78

KUZIN, M. I., SOLOGUB, V. K., VASSERMANN, D., LAVROV, V. A., SHLOTER'YE, Sh., OLYUNINA, N. A., RIYO, M. and OSTOLOPOV, V. A., Institute of Surgery imeni A. V. Vishnevskiy, USSR Academy of Medical Sciences, Moscow; Burns Center, Hospital Koshin [translit.], Paris

[Abstract] A joint Soviet-French study was conducted on the potential usefulness of infrared irradiation in the treatment of burn patients in isolation wards. The study encompassed 72 Soviet patients and 10 French patients with burns over 9-95% of body surface. The ages of the patients ranged from 16 to 64 years. The patients were treated with 2 kvT IR source 180 cm above wound surface, with constant metabolic and temperature monitoring, in addition to standard management employed in such cases. In both centers healing occurred twice as fast with IR treatment than in its absence. In the case of deep burns, lag time to autoplasty was reduced from 48.3 days in IR-untreated control patients to 16.9 days in the experimental group. In addition, the mean duration of hospitalization was reduced to 73.5 days for a control value of 146.3 days. IR therapy was deemed a successful addition to the therapeutic measures used in managing such patients, and its primary beneficial effects were ascribed to a reduction in the energy expenditure of the patients. Additional factors were the inhibition of microbial flora on wound surface and prevention of toxemias. Figures 5; references 2: 1 Russian, 1 Western.
[1061-12172]

UDC 616-001.4-089.844-7:615.36

PREPARATION AND CLINICAL USE OF PORCINE XENOGRAFT DRESSING

Leningrad VESTNIK KHIRURGII IMENI I. I. GREKOVA in Russian No 3, Mar 85 (manuscript received 12 Jul 84) pp 93-94

KULAGIN, I. N., PAFOMOV, G. A., GERASIMOVA, L. I., LOGINOV, L. P., SAUTIN, Ye. N. and KHVATOV, V. B., Scientific Research Institute of Medical Emergencies [Skoraya Pomoshck] imeni N. V. Sklifosovskiy, Moscow

[Abstract] Description is provided of the preparation of porcine xenografts for use as surgical dressing, beginning with skin samples obtained in an abattoir. One method relied on standard sterile techniques for the preparation of the xenograft, while another utilized lyophilization and sterilization by gamma irradiation. Clinical trials were conducted on 107 patients with 2nd to 4th degree burns encompassing up to 70% of body surface. Both preparations were found easy to handle and followed lesion contours, provided for drainage, and were easily removable. The use of the porcine xenografts facilitated formation and status of granulation tissue, alleviated burn toxemia and

shortened the lag time before autotransplantation. These observations were in agreement with other studies on the utility of pig skin xenografts in the treatment of patients with burns. References 5: 2 Russian, 3 Western.
[1061-12172]

UDC 617.089:615.355

IMMOBILIZED ENZYMES IN SURGICAL CLINICS

Leningrad VESTNIK KHIRURGII IMENI I. I. GREKOVA in Russian No 3, Mar 85
(manuscript received 13 Aug 84) pp 126-130

CHEPCHERUK, G. S. and LISHENKO, V. V., Chair of Elective Surgery, Military Medical Academy imeni S. M. Kirov

[Abstract] A general survey is presented of the most signal applications of immobilized enzymes in surgical cases. A number of cases are cited on the use of various proteases, nucleases and other hydrolytic enzymes for controlled wound debridement, thrombolysis, clarification of pleural adhesions, etc. The general clinical impression is that the use of immobilized enzymes in such situations is effective, and that the risk of side effects is minimal. In many instances the duration of action is prolonged by immobilization, while the risk of sensitization appears to be diminished. Although the use of immobilized enzymes in surgical practice represents a new trend, the results to date warrant that this form of treatment will continue to gain new adherents. References 33: 28 Russian, 5 Western.
[1061-12172]

UDC 616.98:579.841.93-07:616.37-008.6

ENDOCRINE FUNCTION OF PANCREAS IN PERSONS WITH HISTORY OF BRUCELLOSIS

Moscow TERAPEVTICHESKIY ARKHIV in Russian No 1, Jan 85
(manuscript received 10 Sep 84) pp 87-89

MOSHNYAGA, M. G., KOSHCHUG, R. K. and VINOGRADOV, V. A., Department of Therapy (headed by docent R. K. Koshchug), Faculty for the Advanced Training of Physicians, Kishinev Medical Institute.

[Abstract] A study was made of persons with a history of brucellosis to determine the status of the endocrine cells of the pancreas with the aid of various food stimulants. In parallel, the function of G cells producing gastrin was evaluated as one probable intermediary on the so-called entero-insular axis. The endocrine function stimulus used consisted of two different food loads. The oral glucose tolerance test was used on forty-eight persons including thirty-four with a history of brucellosis, plus an altered Lundh breakfast consisting of a mixture of 50 g dry milk, 50 ml sunflower oil and 250 ml boiled water with no glucose. In persons with a history of brucellosis

the endocrine portion of the pancreas was found to have been damaged, manifested as a decrease in the secretory reaction of B cells to stimulus by both food tests. These changes apparently result from the fact of the infection, since they were absent in the control group. References 10: 7 Russian, 3 Western. [1050-6508]

INADEQUATE EXPLOITATION OF DEVICE FOR ANESTHESIA

Moscow LENINSKOYE ZNAMYA in Russian 10 Mar 85 p 2

RUVINSKIY, A., correspondent

[Abstract] Several years ago a central electronic method of anesthesia was proposed by A. S. Persianov and his collaborators which was protected by local author's certificates and foreign patents. The apparatus is simple and inexpensive. In addition to obstetrics, it was successfully applied in general therapy, sport medicine, psychotherapy, etc. Recent surveys showed that this apparatus might have been forgotten even though in some isolated areas it is used effectively. Some blame on this underutilization of a promising equipment was put on poor advertising. Some of the ways to solve this problem would be to organize seminars or to arrange for Dr. E. M. Kastrubin, a proponent of this technique, to give lectures on the advantages of this method. Evidently little support could be obtained from government circles. The author suggested that only repeated press appeals on the utilization of new technological advances would have a powerful public health effect.
[302-7813]

UDC: 579.842.23.083.13

POSSIBLE ROUTE FOR OBTAINING SIGNAL OF HIGH TEMPERATURE OF Y. PESTIS CULTURE

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 46, No 6, Nov-Dec 84 (manuscript received 24 Nov 82) pp 42-47

[Article by B. N. Mishan'kin, L. A. Shevchenko, N. V. Korobeynik and G. G. Dikhanov, Rostov-on-Don Scientific Research Institute for Plague Control]

[Text] High temperature (37°C) is a distinctive inductor of synthesis of aggression factors that are necessary for complete expression of virulent properties of the pathogen of plague. The demonstrated difference in consistency of membranes from Y. pestis cells raised at 28 and 37°C, increase in level of intracellular cAMP, along with intensification of adenylate cyclase activity and decline of phosphodiesterase activity, warrant the conclusion that membranes and the system of cyclic adenosine-3'-5'-monophosphate may possibly be involved in expression of the signal of high ambient temperature of Y. pestis.

Plague is a disease of warmblooded representatives of the animal kingdom, whose body temperature is about 37°C with some fluctuations, depending on the species of susceptible host. As compared to cultivation temperature (26-28°C) generally used in laboratory practice, a temperature of 37°C has a stronger effect on the phenotype of Y. pestis, eliciting changes in protein composition of external cell membranes [14], decline or rise in activity of some enzymes [8, 12], additional nutrient factor requirements [18], as well as synthesis of aggression factors that are needed for complete expression of its virulent properties [17]. Several authors [6, 22] have emphasized the importance of high temperature as a distinctive inductor of Y. pestis virulence, while Naylor et al. [22] proved experimentally that subcultures incubated at temperatures in the range of 37-41°C have the greatest virulence. They also demonstrated that a number of metabolites (analogues of amino acids, purines and pyrimidines), as well as the inhibitor of protein synthesis, chloramphenicol, block entirely the process of restoration of virulence of Y. pestis cells without having an appreciable effect on their viability. In spite of the obvious significance of raising temperature as a signal for metabolic changes in the pathogen, which would enable it to succeed in withstanding the macroorganism's efforts to rid itself of the invaded infection, the biochemical mechanisms of this phenomenon have been virtually unstudied.

We submit here data indicative of the possible involvement of cell membranes and system of cyclic adenosine-3',5'-monophosphate (cAMP) in expression of the signal of high ambient temperature in Y. pestis cells.

Material and Methods

In this study, we used cells of eight strains of Yersinia pestis, grown in Hottinger agar with 1% corn extract at 28 and 37°C. Frozen cells, washed in saline, were broken down by passing them twice through an X press (LKB, Sweden) at -25°C. Cell fragments were removed by centrifuging at 16,000 r/min (J-21, Beckman, JA-20 rotor) and supernatant was used for the studies.

The fraction of total membranes was recovered from cells of Y. pestis strain 556/106 cultivated at two temperatures by means of osmotic shock of lithium spheroplasts [7]. External and internal membranes were separated by isopycnic centrifuging in a saccharose density gradient (65-20%) [14]. The isolated preparations were checked by electron microscopy, determination of buoyant density, level of 2-keto-3-deoxyoctonate (KDO) [26], as well as by determination of activity of marker succinate and lactate dehydrogenases, NAD(P)H, ATPase and NAD(P)H:NAD^+ oxidoreductases [1, 10, 13].

Optical density of membrane suspensions was measured on a Beckman recording spectrophotometer at 600 nm [3]. The measuring quartz tray, 1 cm in width, was incubated with a Multicool (LKB, Sweden). Temperature was taken right in the tray using a thermocouple. Before measurement of optical density, the sample was kept at a given temperature for at least 5 min.

Phosphodiesterase activity was measured as previously described [11].

The incubation mixture for measurement of adenylate cyclase activity contained 260 μmol ATP, 4 mmol $MgSO_4$, 50 mmol tris-HCl buffer, pH 9.0, 1 mmol glycine and 40-150 mg of protein from the tested extract. The specimens were kept at 37°C for 10 min, after which they were boiled in a water bath for 2 min. Enzyme activity was expressed in pmol cAMP formed in 1 min in the presence of 1 mg protein.

We determined cAMP according to the instructions of the firm accompanying the set of reagents for assay of cyclonucleotide (Amersham, Radiochemical Centre, England) and expressed it in pmol scaled to 1 mg protein.

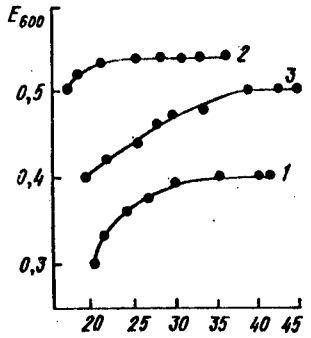
For demonstration of cAMP-binding activity, the incubation mixture in a volume of 0.2 mℓ contained 50 μℓ 50 mM tris-HCl buffer, pH 7.5 with 4 mM EDTA (buffer A), 50 μℓ ^{3}H-cAMP (20000 counts/min) and 100 μℓ of the extract examined (50-100 μg protein). After keeping the specimen in an ice bath for 2 h, we added 100 μℓ carbon suspension to it (2.6% norite in buffer A with 2% ox serum albumin); the mixture was centrifuged for 1 min on a Minifuge (Beckman), and a 200-μℓ aliquot was transferred to a vial with 5 mℓ scintillation liquid, ZhS-8I. Analysis of radioactivity of the specimens was made on a Mark II counter. Activity was expressed in pmol cAMP binding 1 mg protein in 2 h of incubation.

Protein was assayed by the Ehresmann method [15].

The sign criterion [2] was used for statistical analysis of reliability of differences between two sets of results.

Results and Discussion

It is known that the functional activity of biological membranes is largely determined by the condition of their lipid component, which is characterized by temperature-dependent transitions of the "gel-liquid crystal" type. These phase transitions of membrane lipids are associated with drastic changes in membrane permeability, activity of membrane-bound enzymes, membrane resistance to different factors, etc. [9].



Effect of incubation temperature on optical density of Y. pestis membranes

1) preparation of total membranes isolated from cells incubated at 28°C
2) preparation of total membranes from cells incubated at 37°C
3) preparation of external membranes from cells incubated at 28°C

Ten phospholipid fractions, the quantity of which depends appreciably on degree of aeration of the culture [5], were found in membranes of Y. pestis. True, there are no data in the literature about the effect of cultivation temperature on composition of Y. pestis phospholipids; however, by analogy to the results of studies on models of E. coli [20], mycobacteria [24] and Sarcina [19], it can be assumed that there is a link between incubation temperature and degree of saturation of intracellular fatty acids in Y. pestis as well. The existence of such a link is dictated by the need to maintain optimum consistency of membranes and normal function of cells themselves under the often changing environmental conditions.

Our studies on the effect of incubation temperature on optical density of a suspension of fraction of total membranes of cells incubated at 28 and 37°C revealed that they reacted differently to the same temperature. Proceeding from the hypothesis of Binyukov et al. [16] that disaggregation and aggregation processes, in which individual membranes or fragments thereof are involved, make the main contribution to change in optical density, the difference in accentuation of curves 1 and 2 of density (Figure) can be interpreted as the result of dissimilar phospholipid composition of membranes of the strain under study. Apparently due to greater unsaturation of fatty acids in membranes from cells cultivated at 28°C (curve 1), their fluidity is greater, and at temperatures above the lipid melting point there could be more intensive interaction between proteins and lipids due to interpenetration of membrane components. In membranes from cells incubated at 37°C, the assumed high saturation of fatty acids raises the phospholipid melting point, which leads to smoothing of curve 2. On the whole, the process of changes stops at 37°C, probably due to specific, lipid-induced structural changes in the membrane, which alter its optical density and are illustrated in the Figure by the change in the curves to a monotonous line, in spite of continued temperature elevation. The somewhat unique nature of curve 3, which

reflects the change in optical density described in Table 1 of a preparation of external membranes from cells incubated at 28°C, also confirms the idea of induced effect of temperature on membrane properties.

Since the close relationship between structure and function is a typical distinction of membranes, which are a cooperative system [4], the redistribution of components in membranes from cells incubated at 28°C under the effect of higher temperature should cause change in activity of enzymes bound with them also. In this respect, adenylate cyclase (ATP-pyrophosphate lyase [cyclic], 4.6.1.1) involved in synthesis of cAMP, which is a mediator of many biochemical processes is of special interest.

Table 1. Physicochemical characteristics of membrane fractions isolated from Y. pestis cells

Membrane fraction	Density, g/cm³	KDO, nmol/g protein	Enzyme activity, nmol/min/mg				
			SDH	LDH	NAD(P)H DH	NAD(P)H OR	ATPase
External membrane fraction	1,225	85—93	10	14	23	85	30
Internal membrane fraction	1,160	6—10	250	355	1456	980	50

Key: SDH) succinate dehydrogenase
LDH) lactate dehydrogenase
NAD(P)H OR) NAD(P)H:NAD$^+$ oxyreductase
DH) dehydrogenase

Table 2. Effect of cultivation temperature on cAMP content and activity of enzymes of its metabolism in Y. pestis strains

Strain	Temp., °C	cAMP, pmol/mg protein	Adenylate cyclase activity pmol/min/mg protein	PDEase activity, μmol RNP/mg protein
556/106	28	0,18	4,21	0,18
	37	0,34	16,43	0,13
EV 1290	28	1,21	2,34	0,34
	37	1,52	31,27	0,11
ZhVR-19	28	0,40	1,90	0,03
	37	1,02	8,50	0,02
17/1093	28	0,27	2,70	0,45
	37	0,54	2,90	0,42
1/1092	28	0,59	20,10	0,29
	37	0,99	38,40	0,22
773/101	28	0,55	6,00	0,48
	37	0,61	9,50	0,27

Key: PDE) phosphodiesterase
RNP) ribonucleoprotein [?]

We succeeded in demonstrating cAMP in all Y. pestis strains used in our study. Its intracellular content was in the range of 0.2-1.5 pmol/mg protein, depending

on individual distinctions of strains and incubation temperature (Table 2). The cells of subcultures incubated at 37°C were characterized by a higher content of the cyclonucleotide than in cells of subcultures incubated at 28°C. Statistical processing of the data using the nonparametric sign criterion demonstrated reliability of the observed phenomenon with a probability of 0.95.

As in E. coli [25], adenylate cyclase activity was present in Y. pestis cells in membrane-bound and cytoplasmic states. There was about the same amount of each of these two forms, and it did not change with change in cultivation conditions.

The increase in cAMP content of Y. pestis cultures incubated at 37°C was associated with increase in adenylate cyclase activity and concurrent decrease in activity of previously described phosphodiesterase [11]. Such coordination of enzyme function apparently leads to formation in the cell of its own stationary concentration of cyclic nucleotide at each cultivation temperature. Moreover, according to the criteria of Pastan and Perlman [23], it is indicative of involvement of the cyclonucleotide in transmission of the cellular response and in formation of the pathogen's phenotype.

Table 3. Effect of cultivation temperature on cAMP-binding activity of Y. pestis strains

Strain	Temp. °C	Amount of cAMP bound by 1 mg protein in 2 h pmol/mg protein	Strain	Temp. °C	Amount of cAMP bound by 1 mg protein in 2 h, pmol/mg protein
556/106	28	0,224	2357	28	0,678
	37	0,381		37	0,720
EV 1290	28	0,473	17	28	0,460
	37	0,548		37	0,882
2356	28	0,795	1	28	0,118
	37	0,915		37	0,153

It was found that Y. pestis extracts had rather distinct cAMP-binding capacity, the extent of which varied from strain to strain (Table 3). This capacity, which was demonstrated in all 6 tested strains, increased by 11-92% when cells were cultivated at 37°C.

Thus, the signal of high temperature is apparently accepted in Y. pestis by the cell membrane, the structural changes of which activate adenylate cyclase, which leads to increase in intracellular cAMP content and intensification of cAMP-binding capacity. If we accept the opinion of some authors [21] that all cAMP effects in bacteria are mediated by protein kinase stimulation, we should expect increase in intracellular phosphorylation, which has a substantial effect also on RNA-polymerase activity [16], its capacity to recognize genes on the pathogen's chromosome. This capacity may vary over a wide range, from total "failure to recognize," when the pathogen's phenotype acquires some sort of defect (for example, growth factor requirement at 37°C), to intensified reading of "well-recognizable" genes, as a result of which a certain group of characters (for example, determinants of virulence) would be strongly marked.

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10,657
CSO: 1840/1829

UDC 576.8

OPTICAL-STRUCTURAL MACHINE ANALYSIS (OSMA) OF TRANSITION STATES OF CHEMOSTATIC YEAST POPULATION

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 20, No 5, Sep-Oct 84 (manuscript received 14 Feb 83) pp 705-711

POZMOGOVA, I. N., RABOTNOVA, I. L., YANOVSKIY, K. A., SHIKHER, V. I., KUIMOVA, T. F., SHUL'GOVSKAYA, Ye. M., BERESTENNIKOVA, N. D., ANDREYEVA, Ye. A., ZAIKINA, A. I. and SOBOLEV, N. N., Institute of Microbiology, USSR Academy of Sciences, Moscow; All-Union Scientific Research Institute of Biosynthesis of Protein Substances, Moscow; Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino

[Abstract] A study was made of the following questions: how rapidly do morphophysiological properties of a chemostatic culture change when recorded by the method of optical-structural machine analysis (OSMA) in a transition state caused by a change of one of the cultivation conditions of yeast, by increasing or decreasing the rate of dilution? A culture of Candida quilliermondii sp. on a synthetic medium was used, as well as Candida utilis, grown on a different synthetic medium. After steady states were reached in the chemostat, D [rate of dilution] was changed, then the status of the population analyzed every two hours. The method of optical-structural machine analysis was used, based on automatic microscanning in anoptral contrast of a large number of cells (at least 100) with a measurement step of 0.5 μm. The experimental data indicate high sensitivity of OSMA when used to determine the morphophysiological properties of yeast populations. Changes in morphophysiological properties of yeast populations occurring over one generation after a change in rate of dilution and measured by OSMA can be used more rapidly than the characteristics x and Y [growing microorganisms and economic coefficient]. Figures 2; references: 11 Russian.
[1591-6508]

KINETIC REPRESENTATION OF BACTERIUM MOVEMENT CAUSED BY CHEMOTAXIS

Moscow BIOFIZIKA in Russian Vol 30, No 1, Jan-Feb 85 pp 93-97

ZAVALSKIY, L. Yu., SVETOGOROV, D. Ye. and BREZGUNOV, V. N., All-Union Scientific Research Institute of Applied Microbiology, Serpukhov, Moscow Oblast'.

[Abstract] An analysis is presented of the movement of populations of bacteria in a spatial gradient of a chemoeffector based on a kinetic equation. The applicability of a single velocity transfer equation to modeling of spatial chemotaxis of bacteria is demonstrated. This approach allows the coefficients of previously used phenomenologic equations to be related to the characteristics of motion of individual bacteria. Possible applications of the diffusion approximation of the equation include studies of dynamics of spatial distribution of bacterial populations under the influence of chemotaxis. References 14: 2 Russian, 12 Western.
[1741-6508]

COMPENSATION EFFECT IN PROCESSES OF THERMAL INACTIVATION OF MICROORGANISMS

Moscow BIOFIZIKA in Russian Vol 30, No 1, Jan-Feb 85
(manuscript received 23 May 84) pp 98-102

MUNBLIT, V. Ya. and TROFIMOV, V. I., Scientific Research Institute for Biological Testing of Chemical Compounds, Kupavna, (Moscow Oblast').

[Abstract] Parameters of the compensation effect are calculated for thermal inactivation of various classes of microorganisms and cell components for a large number of ΔS and ΔH values calculated from experimental results published by various other authors. It is concluded that thermal denaturation of protein is a critical and limiting stage in the process of thermal death of microorganisms. Based on the presence of a compensation effect for thermal death of microorganisms, the conditions of thermal pasturization and sterilization are studied. This article does not discuss the possible nature of the compensation effect in biological objects. References 13: 3 Russian, 10 Western.
[1741-6508]

UDC 579.852.11.085.5:543.4

INFRARED SPECTRA OF DIFFERENT VARIANTS OF BACILLUS THURINGIENSIS

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 46, No 6, Nov-Dec 84
(manuscript received 25 Mar 83) pp 6-9

LYSENKO, L. N., MIKHNOVSKAYA, N. D., KHRANOVSKIY, V. A., YELKONINA, L. A. and ZAKRZHEVSKAYA, I. A., Kiev State University

[Abstract] Comparative analysis was conducted on the IR spectra of Bacillus thuringiensis variants in relation to toxigenicity. Essentially identical IR patterns were obtained for all the variants under study. The densities of the

recordings, however, varied directly with the duration of culture in liquid medium. In addition, the optical densities of the recording were always higher in strains producing both exo- and endotoxins than in those producing endotoxins only. Figures 3; references: 5 Russian.
[1826-12172]

UDC 579.841.11.083.13

INTERACTION OF PSEUDOMONAS STRAINS USED IN WATER TREATMENT WITH RABBIT ALVEOLAR MACROPHAGES

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 46, No 6, Nov-Dec 84 (manuscript received 20 Apr 83) pp 26-30

TUL'CHINSKAYA, V. P., GUDZENKO, T. V., KALMAZAN, L. A., KOZHANOVA, G. A., and SINENKO, G. I., Odessa State University

[Abstract] Studies were conducted on the in vitro virulence characteristics of Pseudomans aeruginosa and Ps. fluorescens strains proposed for use in water treatment, using as a criterion in vitro phagocytosis by rabbit alveolar macrophages. The data showed that on the whole, Ps. aeruginosa were considerably more resistant to phagocytosis than Ps. fluorescens strains. After 6-24 h of exposure to Ps. fluorescens 85-91.3% of the phagocytic cells had ingested the bacteria, whereas only 29.8% had phagocytosed Ps. aeruginosa. It appears, therefore, that the Ps. fluorescens strains I-17, Kf-8, U-9, 2a, 5, and BKMB-894(H) selected for water treatment are nonvirulent. References 11: 10 Russian, 1 Western.
[1826-12172]

UDC 579.842.1/2.044

EFFECTS OF 1(p-NITROPHENYL)-2-AMINO-1,3-PROPANEDIOL DERIVATIVES AND BETA-CHLOROETHYLPHOSPHONIC ACID ON ENTEROBACTERIAL GROWTH

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 46, No 6, Nov-Dec 84 (manuscript received 30 Mar 83) pp 39-42

SHATILO, V. A., ZARITSKIY, A. M., KUDRYA, T. N. and SHTEPANEK, A. S., Kiev Scientific Research Institute of Epidemiology and Infectious Diseases; Institute of Organic Chemistry, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] As part of a search for chemicals that may be useful in the design of selective media, the following agents were tested for their effects on the growth of a variety of enteric microorganisms: 1-(p-nitrophenyl)-2-amino-1,3-propanediol (alpha-isomer)(I), I-HCl (II), 1-(p-nitrophenyl)-2-aminoethanol-beta-chloroethyl phosphate (III), I-monosodium sulfate (IV), and beta-chloroethylphosphonic acid (V). Of the agents tested, I was found most effective in the inhibition of S. sonnei, S. flexneri, Sal. typhimurium, E. coli, S. aureus, and C. albicans in concentrations of 0.5 and 1%. III was effective against C. albicans but not against the bacteria, while V had the reverse

effects of III, IV, in analogy to III, was also ineffective against the organisms tested. In low concentrations (0.001-0.005%) I stimulated the growth of S. sonnei, S. flexneri, Sal. typhimurium, S. aureus and E. coli, but had no effect of C. albicans. In similar concentrations III stimulated the growth of C. albicans but was without effects on the bacteria, while V exerted a weak stimulatory effect on S. sonnei, S. flexneri, E. coli and Sal. typhimurium. The remaining compounds had no stimulatory effects on any of the microorganisms tested. These observations suggest that the agents in question and their congeners may constitute a source of reagents useful in selective media for enterics. References: 6 Russian.
[1826-12172]

UDC 579.843.1.253

VARIABILITY OF CHOLERA VIBRIOS AT 5°C

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 46, No 6, Nov-Dec 84
(manuscript received 28 Mar 83) pp 48-51

SHEPELEV, A. P., ANDRUSENKO, I. T., ALEKSANDROVA, I. K. and ALEKSEYENKO, V.V., Kiev Scientific Research Institute of Epidemiology and Infectious Diseases; Rostov-on-Don Scientific Research Institute of Epidemiology, Microbiology and Hygiene

[Abstract] Studies were conducted on the effects of cultivation at 5°C on the survival of classic cholera vibrios, El Tor variants, and noncholerigenic strains to assess cold-survival as a possible mechanism of cholera vibrio persistence. Cultures grown on alkaline media under standard conditions were used to inoculate 0.25% peptone broth to give 10^6 vibrios/ml, with determinations of survival times at 5°C. Under the conditions specified, the classic and El Tor vibrios survived for only 5-7 days, with the counts dropping by 50% or more in 2 days. Weakly cholerigenic El Tor vibrios survived for ca. 14 days, while noncholerigenic El Tor biotypes and atypical strains survived for 24 days or more. Analysis of antigenic variability in relation to low temperatures and the accompanying loss of virulence suggest that the noncholerigenic variants represent saprophytic forms of the cholera vibrio. Acquisition of the antigenic characteristics of the classical vibrio by nonagglutinable low-temperature-tolerant atypical vibrios raises the possibility that the latter forms represent an adaptive mechanism of survival in the interepidemic periods. Figures 1; references 10: 9 Russian, 1 Western.
[1826-12172]

UDC 550.72:576.8.095:546.11

INFLUENCE OF MILK SERUM AND YEAST PRODUCTION WASTES ON GROWTH OF HYDROCARBON-OXIDIZING MICROORGANISMS AND DECOMPOSITION OF OIL BY THEM

Baku IZVESTIYA AKADEMII NAUK AZERBAYDZHANSKOY SSR: SERIYA BIOLOGICHESKIKH NAUK in Russian No 5, Sep-Oct 84 pp 94-100

MAMED'YAROV, M. A., ISMAYLOV, N. M. and DVEYRIN, V. L., Microbiology Sector, Azerbaijan Academy of Sciences

[Abstract] The purpose of this work was to study the influence of organic compounds contained in milk serum and the wastes from production of nutrient yeast on the constructive metabolism of hydrocarbon-oxidizing microorganisms (HOM) and their functional activity. The object of study was accumulative culture of aerobic HOM obtained by inoculation of petroleum-saturated soil collected near oil wells on a mineral medium. The effect of milk serum and yeast waste water on HOM development and decomposition of petroleum were studied in 100 ml flasks containing 50 ml of the solutions tested. The results indicate the positive influence of both substances tested on the development of the HOM biocenosis, an increase in the degree of decomposition of petroleum and the possibility of utilizing the organic matter tested as easily available substrates. The wastes from the production of nutrient yeasts and milk serum are therefore recommended as activators for the development of a complex of petroleum-oxidizing microorganisms for use in recultivation of petroleum contaminated soils and to increase petroleum output of oil-bearing strata. Figures 2; references 12: 9 Russian, 3 Western.
[1054-6508]

UDC 616-036-865:355

CARE OF INVALIDS AND WAR VETERANS

Moscow ORTOPEDIYA, TRAVMATOLOGIYA I PROTEZIROVANIYE in Russian No 3, Mar 85 (manuscript received 20 Nov 84) pp 1-5

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[Abstract] The deep concern of the party and the government for the veterans, invalids and their families after the Great Patriotic War finds manifestations in the many services and amenities provided for them. In addition to rent subsidies and free medical care, they have first call on recreational facilities, transportation, special pension funds, and so forth. In the Ukraine alone there are some two million war veterans, and in the current Five-Year Plan the invalids and their families and the families of the war dead have been provided with 30,000 new residential units, while invalids with locomotor dysfunction have been provided with more than 45,000 free Zaporozhets automobiles, especially equipped for operation by the handicapped. All across the Ukraine, additional provisions are being made to expand the health and social care rendered to this category of citizens. The various health and trauma centers of the Ukraine are continually devising new and better orthopedic devices, utilizing the latest advances in cybernetics and biofeedback technology. It is the patriotic duty of the Soviet state and people to remember what the invalids and veterans accomplished some 40 years ago, and to provide them with just rewards.
[1059-12172]

UDC 616-036-865:355

PERIODIC HEALTH EXAMINATIONS AND TREATMENT OF INVALIDS AND VETERANS OF GREAT PATRIOTIC WAR

Moscow ORTOPEDIYA, TRAVMATOLOGIYA I PROTEZIROVANIYE in Russian No 3, Mar 85 (manuscript received 12 Nov 84) pp 5-7

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[Abstract] With the implementation of the periodic health examination program [dispensarization] in the USSR, a problem arose with the application of this measure to the invalids and veterans of the Great Patriotic War [WW II]

because of their age and disabilities. In view of this, special measures have been implemented in the Tatar ASSR to facilitate such health care, including the organization of special mobile teams. As a result, in the Tatar ASSR some 90% of the invalids and veterans have already undergone examination under this program, and 26.4% of them are enlisted in outpatient care facilities. The figures vary, but are similar for other regions of the RSFSR. The entire process of health care delivery to this particular population category will be even more efficient in the future, with the construction of new facilities and reorganizational changes intended to further improve patient contact. [1059-12172]

UDC 576.809.756

INFLUENCE OF GRAIN MOISTURE CONTENT AND TEMPERATURE ON BIOSYNTHESIS OF PATULIN BY FUNGUS PENICILLIUM URTICAE BAINIER

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 20, No 5, Sep-Oct 84 (manuscript received 9 Feb 83) pp 664-667

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[Abstract] Patulin is a mycotoxin produced by a number of fungi from the genera Penicillium, Aspergillus, Byssochlamys and Paecilomyces. It is toxic, carcinogenic, mutagenic and teratogenic. A study is presented of toxin formation by penicillium urticae bainier when grown on four types of grain, as well as the influence of the moisture content and temperature on the process of patulin formation. Wheat, barley, oats and corn were used with moisture contents of 15, 20, 25 and 30%, temperatures 10, 20, 25 and 30 degrees for twenty-one days. Patulin content of the grain samples was determined at 5, 10, 14, 18 and 21 days. A combination of factors influencing the status of the fungus culture has a great influence on patulin formation. High moisture content at temperatures of 20 to 25°C leads to rapid growth of the fungus mycelium and biosynthesis of patulin. At low moisture content and temperatures of 10 and 30°C, the development of fungus is inhibited on all types of grain tested and the biosynthesis of patulin is reduced or completely eliminated. Figure 1; references 12: 4 Russian, 8 Western.
[1591-6508]

UDC 615.332.033.076.9

PHARMACOKINETICS OF LIPOSOMAL STREPTOMYCIN IN MICE

Moscow FARMATSIYA in Russian Vol 33, No 6, Nov-Dec 84 (manuscript received 5 Jan 84) pp 38-42

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[Abstract] An assessment was made of the pharmacokinetics of soluble and liposomal streptomycin in (C57BL x CBA)F_1 mice, to evaluate the effectiveness

of the latter dosage form in assuring high antibiotic levels. Liposomal tail vein injections were in dosages of 65 or 150 mg/kg, while the soluble preparation was employed in a dose of 65 mg/kg since the soluble 150 mg dose was lethal due to myorelaxation. Over a 24 h period of observations the blood (serum) levels of streptomycin were highest with the 150 mg/kg liposomal injection, followed by the 65 mg/kg liposomal injection, and the soluble streptomycin. Toward the end of the 24 h the serum levels tended to converge, although the liposomal forms still delivered a higher level. Renal and pulmonary levels of the antibiotic were essentially identical with both dosage forms when 65 mg/kg of streptomycin was injected; the 150 mg/kg liposomal form insured much higher levels. However, the splenic levels of the antibiotic were statistically higher with the liposomal injections, due to cellular uptake of the liposomes. These observations indicate that liposomal forms of antibiotics may be useful in assuring high levels in clinical situations.
Figures 1; references 11: 7 Russian, 4 Western.
[1852-12172]

UDC 615.272.4.014.425.033.1.076.9

EFFECTS OF ADMINISTRATION ROUTE ON GLUTATHION BLOOD LEVELS IN ANIMALS

Moscow FARMATSIYA in Russian Vol 33, No 6, Nov-Dec 84
(manuscript received 19 Jan 84) pp 42-44

UZBEKOVA, D. G., BELKINA, Z. V. and SELEZNEV, N. G., Ryazan Medical Institute imeni Academician I. P. Pavlov

[Abstract] Outbred rats were employed in a study on the correlation between the route of administration of exogenous reduced glutathion and its resultant blood levels. The most immediate rise in blood levels was obtained with rectal administration of glutathione (4% solution to give 100 mg/kg), reaching a maximum value in 20 min and thereafter decreasing to baseline by ca. 90 min. With intramuscular, intraperitoneal and per os administration a rise was seen in 30 min with the highest levels obtained in 50-65 min. The longest sustained period (2 h) of elevated glutathione was obtained with the per os route, and the shortest with rectal administration (45 min). The route of administration was thus shown to significantly affect attainable blood levels.
References 17: 1 Romanian, 15 Russian, 1 Western.
[1852-12172]

UDC 340.627:615.277.3:547.861.3].099.074

PHOTOMETRIC DETERMINATION OF DIPIN

Moscow FARMATSIYA in Russian Vol 33, No 6, Nov-Dec 84
(manuscript received 21 Dec 83) pp 72-73

KARTASHOVA, L. Kh. and SALOMATIN, Ye. M., Bureau of Forensic Medical Expertise, Vitebsk Oblast Department of Health; Scientific Research Institute of Forensic Medicine, Moscow

[Abstract] A method is described for the photometric analysis of dipin, which is based on preliminary oxidation of the analyte with concentrated nitric acid and reaction with ammonium molybdate. The resultant blue product, phosphomolybdic acid, can be read at 670 nm, and the readings for unknowns compared with a standard curve. Recovery studies yielded results in the 95-101% range. References: 3 Russian.
[1852-12172]

UDC 340.67:615.285.7.074

SELECTIVE DETECTION OF BAYTEX IN AUTOPSY MATERIAL

Moscow FARMATSIYA in Russian Vol 34, No 2, Mar-Apr 85
(manuscript received 31 Jul 84) pp 55-58

GORBACHEVA, N. A. and ORLOVA, A. M., Scientific Research Institute of Forensic Medicine, Moscow

[Abstract] A method has been developed for the isolation and identification of Baytex, an organophosphorus pesticide, in autopsy materials. The technique allows for differentiation from other most frequently encountered organophosphorus pesticides, drugs encountered in combined toxicity with organophosphorus compounds, and other toxic agents that possess functional groups similar to those of Baytex. The analytical method involves preliminary extraction with hexane, subsequent purification in hexane-dimethylformamide mixture, preparative isolation on silicagel TLC, and identification. The qualitative TLC analysis on the silicagel plates is conducted in a benzene system with three complementary color reactions. The latter involves a palladium reagent (for sulfur substances), the Stenersen test using brilliant green (for organophosphorus compounds), and 4-aminoantipyrine after alkaline hydrolysis. The method was found effective in differentiating Baytex from other agents of interest on the basis of R_f values amd staining characteristics. References 3: 2 Russian, 1 Western.
[1854-12172]

UDC 616.89-008.441.13-092.9-02:547.262]-07

EFFECTS OF CATECHOLAMINE AGONISTS AND ANTAGONISTS ON ALCOHOL UPTAKE IN RATS WITH DIFFERENT STAGES OF EXPERIMENTAL ALCOHOLISM

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 19, No 2, Feb 85 (manuscript received 28 Apr 84) pp 135-139

BUROV, Yu. V. and VARKOV, A. I., Department of Neuropharmacology, Institute of Pharmacology, USSR Academy of Medical Sciences, Moscow

[Abstract] The effects of various catecholamine agonists and antagonists on 15% ethanol ingestion (ad libitum) by outbred albino rats were studied in relation to the stage of experimental alcoholism. In animals with stage I and II alcoholism, alcohol intake was most profoundly inhibited by administration of alpha-adrenoblockers (AA), klofelin [sic], and alpha-methyl-DOPA (AMD), while L-DOPA and cocain stimulated a significant increase in ethanol ingestion. In stage III alcoholism, both AA and L-DOPA depressed alcohol intake, while AMD and haloperidol had a stimulatory effect. It appears, therefore, that different neurochemical mechanisms are involved in alcohol dependence in different stages of experimental alcoholism in the rat. Furthermore, it seems evident that alpha-adrenergic receptors have a key function in maintaining alcohol dependence. In well-established physical dependence, the importance of the noradrenergic system seems to diminish and dopaminergic mechanisms appear to become predominant. Consequently, in the initial stages of alcoholism, agents which depress the noradrenergic system seem indicated, while at the stage of physical dependence agents which normalize noradrenergic mechanisms and depress dopaminergic mechanisms should be considered. References 13: 7 Russian, 6 Western.
[1850-12172]

UDC 615.276.4.015.46.07

VARIED EFFECT OF TONIC AGENTS ON IMMUNE RESPONSE OF MICE

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 19, No 2, Feb 85 (manuscript received 24 Apr 84) pp 139-142

MIROSHNICHENKO, I. V., YARILIN, A. A., AKNAZAROVA, R. K. and TROFIMCHUK, S. M., Institute of Immunology, USSR Ministry of Health

[Abstract] CBA and (CBA x C57BL/6)F_1 mice were employed in a study to determine the effects of standard tonic agents--ginseng (per os), eleutherococcus (per os), and saparal (per os and i.p.)--on the immune status when administered in doses of 0.004 to 4.0 mg/mouse. Following a 10-day course of pretreatment, the primed animals were injected with 10^8 SRBC i.p. to assess the status of humoral and cellular immunity. In terms of the immune response, ginseng was found to be innocuous; however, eleutherococcus stimulated a ca. 20-fold increase in the antibody response, while saparal was inhibitory. The

inhibitory effects of saparal on the immune response were mediated via both the B and T cells, but the primary target appeared to be T-helper cells. The data thus demonstrated that the tonic agents commonly employed in clinical practice have variable effects on immunity, and that the inhibitory consequence of saparal administration deserves further attention. References: 4 Western.
[1850-12172]

UDC 615.277.3.012.07

PREPARATION AND ACTIVITY OF SUSTAINED-RELEASE METHOTREXATE

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 19, No 2, Feb 85 (manuscript received 18 May 84) pp 149-154

PRIGOZHINA, M. M., VIRNIK, R. B., FRUMIN, L. Ye., GAMBURG, L. Yu., BUKHMAN, B. M. and SYRKIN, A. B., All-Union Scientific Research Institute of the Textile and Haberdashery Industry; Scientific Research Institute of Experimental Tumor Diagnosis and Therapy, All-Union Oncological Scientific Center, USSR Academy of Medical Sciences, Moscow

[Abstract] Studies were conducted on the clinical efficacy and toxicity of sustained-release preparations of methotrexate, prepared by adsorption of the drug on cellulose phosphate or polypropylene material, enveloped by a polyethylene film and sterilized by gamma irradiation. Individual packets contained from 1.5 to 240 mg/g carrier of methotrexate. Clinical trials were conducted with DBA/2 and (C57BL/6 x DBA/2)F_1 mice, carrying transplantable lymphoblastic leukemia L-1210 cells. In comparison with soluble methotrexate, the sustained-release preparations, administered as subcutaneous depots, were found to be clinically more effective in prolonging survival time than the soluble preparation but considerably more toxic. The depot forms were toxic at a concentration of 5 mg/kg, whereas equivalent toxicity with the soluble drug was seen only with a dose of 75 mg/kg. Per os administration of activated charcoal, folic acid, inosine, allopurinol and thymidine alleviated the toxicity. These preliminary observations show that slow-release preparations of methotrexate appear to have potential clinical usefulness, but will have to be carefully assessed and monitored for side effects. Figures 5; references 22: 1 Slovak, 13 Russian, 8 Western.
[1850-12172]

UDC 615.849.1.015,25],0112,1

SYNTHESIS AND RADIOPROTECTIVE ASSESSMENT OF 1,2-DI[3-[2-AMINOETHYL]INDOLYL-5]-ETHANE

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 19, No 2, Feb 85 (manuscript received 24--month illegible--84) pp 158-161

CHESHMARITASHVILI, M. G., GORDEYEV, Ye. N., SAMSONIYA, Sh. A. VASIN, M. V., SHAMSHINA, V. L. and SUVOROV, N. N., Tbilisi University; Moscow Institute of Chemical Technology imeni D. I. Mendeleyev

[Abstract] Studies on the chemical characteristics and biological properties of bisindoles led to the synthesis of 1,2-di[3-[2-aminoethyl]indolyl-5]ethane (I), and its testing for radioprotective properties and toxicity in (CBA x C57BL) mice. Intraperitoneal administration of I in doses of 0.05 to 0.25 mM/kg was devoid of radioprotective effects in mice exposed to 9 Gy Co-60 gamma irradiation. The LD_{50} for I in the hybrid mice under study was established at 0.53 mM/kg. References 5: 3 Russian, 2 Western.
[1850-12172]

UDC 615.2/.3.015.4:577.2]:519.25

STATISTICAL APPROACH TO PREDICTION OF BIOACTIVITY OF MULTIATOMIC MOLECULES USING STRUCTURAL FORMULA DESCRIPTORS

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 19, No 2, Feb 85 (manuscript received 17 May 84) pp 179-185

NIGMATULLIN, R. S., OSIPOV, A. L., PUZATKIN, A. P. and KOPTYUG, V. A., Novosibirsk State University imeni Lenin's Komsomol

[Abstract] Mathematical analysis is presented of the use of the theory of statistical solutions as applied to structural formulas to predict potential biological activity. The analysis was conducted on atoms and molecular fragments, e.g., CH_3, CH_2, CH, NH_2, etc., and their primary atomic environment and the bonds involved. The use of algorithms to such statistical problems has shown that it is possible to derive information on the biological activity from such descriptors. A trial run on 757 herbicides, insecticides and fungicides with defined activities, and an available structural file on 2800 compounds [The Sadtler Standard Spectra, ^{13}C,NMR Spectra, Philadelphia, 1975-1982, v. 1-65], demonstrated that biological activity can be predicted on the basis of the descriptors selected with an error of ca. 10%. Figures 1; references 15: 14 Russian, 1 Western.
[1850-12172]

UDC 633.88

MEDICINAL PLANT RESOURCES OF KAZAKHSTAN AND PROSPECTS OF THEIR RATIONAL USE

Alma-Ata VESTNIK AKADEMII NAUK KAZAKHSKOY SSSR in Russian No 1, Jan 85
pp 36-39

KUKENOV, M. K., ATALYKOVA, F. M. and GEMEDZHIYEVA, N. G.

[Abstract] Development of measures for rational use of useful wild plants requires a knowledge of their reserves, cost of raw material, times of collection, intervals of procurement etc.. In spite of the successes obtained in chemical sciences, some plants have not lost their importance. These include medicinal plants from which KazSSR personnel produce nearly 40 percent of the medicinal preparations. Interest in medicinal plants is growing and the amount of raw material gathered is increasing. The demand for medicinal plants more than doubled from 1970-1980 and now exceeds 88,000 tons and will reach 109,500 tons by the end of the 11th Five-Year Plan. The 1981-1985 demand for medicinal raw material will be satisfied by 73.2-70.9 percent. Intensification of anthropogenic actions, intense use of one species, reduction of plant habitat have called for creation of a balanced, rational system of exploitation of curative plants. In Kazakhstan, santonica wormwood and silt ferula are endangered species. Tyan-Shan adonis, spring adonis, rose-root stone-crop, lily of the valley, marsh tea, bearberry, many species of barberry and Pavlovian rose are among the more than 50 species that are now rare. This situation shows the need for development of a system of rational use of medicinal plants. Such a system must include expansion of work with the plant resources including careful counts of remaining reserves, careful study of biological features of species and their age composition and renewal of plants after procurement.
References: 13 Russian.
[1815-2791]

UDC 613.62+616-057]-092.12:612.014.49

ESTIMATE OF PRENOSOLOGIC STATES IN VARIOUS OCCUPATIONAL GROUPS BASED ON REGULATORY SYSTEM ACTIVITY

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 12, Dec 84 (manuscript received 25 Nov 83) pp 33-37

BRODYAGIN, N. A. and PETROVA, Ye. A., Institute of Labor Hygiene and Occupational Diseases, Leningrad

[Abstract] Estimates are presented of prenosologic states in various occupational groups as a function of labor activity. Data were collected by repeated examination of open pit and underground mining machine operators, dump truck drivers, drilling machine operators, milling machine and grinding machine operators from a metallurgical plant and mine laborers plus a group of vibration sickness patients. Prenosologic states were diagnosed by the index of activity of regulatory systems calculated from the mathematical-statistical, autocorrelation and spectral characteristics of the cardiac rhythm. This characteristic is suggested as a criterion for the degree of adaptation of the organism. The structure of prenosologic states in various occupational populations is heterogeneous and is determined by the conditions and nature of labor activity. References: 6 Russian.
[1743-6508]

UDC 612.834+616.8-009.624

CHANGE IN LEVEL OF β-ENDORPHIN IN BRAIN AND SPINAL FLUID UPON TRANSCRANIAL ELECTROANALGESIA

Leningrad FIZIOLOGICHESKIY ZHURNAL SSSR IMENI I. M. SECHENOVA in Russian Vol 71, No 1, Jan 85 (manuscript received 26 Jul 84) pp 56-64

AYRAPETOV, L. N., ZAYCHIK, A. M., TRUKHMANOV, M. S., LEBEDEV, V. P., SOROKOUMOV, V. A., KATSNEL'SON, Ye. S., ABISOGOMYAN, V. G. and KODZAYEV, Yu. K., Laboratory of Circulatory Physiology (headed by V. V. Orlov), Institute of Physiology imeni I. P. Pavlov, USSR Academy of Sciences; Department of Pathologic Physiology (headed by A. M. Zaychik), Pediatric Medical Institute, RSFSR Ministry of Health, Leningrad

[Abstract] Experiments on rabbits and observations of healthy persons and persons suffering from pain were used to attempt to determine whether endorphin mechanisms are activated by electroanalgesia, which would indicate that

transcranial electric fields activate the antinociceptive system. This was done by determining the change in content of β-endorphin in rabbits and humans in the spinal fluid during and after electroanalgesia, as well as the change in content of β-endorphin in certain segments of the brain and spinal column and in the hypophysis of rabbits. The data and some observations which will be published in the future indicate that transcranial electroanalgesia causes activation of the endorphin mechanisms of the actinociceptive system of the brain stem and spinal column though this is not the entirety of the effect. This requires further and more detailed study of the mechanism of development of transcranial electroanalgesia. Figures 2; references 19: 5 Russian, 14 Western.
[1744-6508]

UDC 612.015/127.002+616.127/621.31

DIVISION OF ENERGY AND CONTRACTIVE CAPACITY OF GYCERINIZED MYOCARDIAL FIBERS IN EXPERIMENTAL INFORMATION NEUROSIS

Leningrad FIZIOLOGICHESKIY ZHURNAL SSSR IMENI I. M. SECHENOVA in Russian
Vol 71, No 1, Jan 85 (manuscript received 29 Jun 83) pp 113-119

KARSANOV, N. V., KHANANASHVILI, M. M., NAKHAPEMOVA, Zh. A., SUKNIDZE, Ts. G., KARTVELISHVILI, R. G. and ARZUMELASHVILI, M. I., GSSR Scientific Research Center of Medical Biophysics, Georgian Ministry of Health (headed by N. V. Karsanov); Institute of Physiology imeni I. S. Beritashvili, Georgian SSR Academy of Sciences (Director M. M. Khananashvili), Tbilisi

[Abstract] Experimental information neurosis results from the need to maintain a high level of analytic-synthetic activity of the brain with a chronic shortage of time and high behavioral motivation in animals. The neurosis is manifested as loss of memory, disruption of regulation of emotions and automic functions of the body. The present report presents data on the energy supply and contractile capacity of the system of contractile proteins of the myocardium in experimental information neurosis in dogs. Data are obtained for the first indicating a decrease in the capability of the system of contractile proteins, myofibrills of the myocardial cell to generate force and perform work under these conditions. It is thought that the pathogenesis of this phenomena involves the overload of the heart by pressure resulting from information neurosis-induced arterial hypertension. Similar disorders in the system of transformation of chemical energy to mechanical work and transport of calcium probably develop in the human myocardium in informational neurosis, leading to the development of weakness of cardiac activity. References: 20 Russian.
[1744-6508]

UDC 612.1+612.273

PARTICIPATION OF PEPTIDE MECHANISMS IN PHYSIOLOGICAL REACTIONS OF CARDIOVASCULAR SYSTEM TO HYPEROXIA

Leningrad FIZIOLOGICHESKIY ZHURNAL SSSR IMENI I. M. SECHENOVA in Russian
Vol 71, No 1, Jan 85 (manuscript received 12 May 83) pp 120-125

FILATOV, A. V., Central Scientific Research Laboratory (headed by E. G. Bykov); Department of Pathologic Physiology (headed by A. N. Leonov), State Medical Institute imeni N. N. Burdenko, Voronezh

[Abstract] Noting that changes in hemodynamics represent an important part of the physiological reaction of the body to hyperoxia, this study examined possible means by which hyperoxia might influence the peptide links in regulation of circulation. Four series of experiments were performed on mongrel white rats under narcosis. Series one monitored the influence of experimental conditions on hemodynamics, including hyperoxia (303.9 kPa for 50 minutes), the influence of hyperoxia on hemodynamics with stimulation of the opiate receptors with morphine, the height of the hypotensive effect of clophelin, as well as the joint effect of clophelin and morphine and inhibition of angiotensin converting enzyme. In series two, the influence of hyperoxia on circulation was studied with posthemorragic hypotension. In series three, the influence of hyperoxia on hemodynamics was studied in hypertensive rats with renovascular hypertension produced by stenosis of both renal arteries. In series four, the influence of hyperoxia on circulation was studied at the height of the hypertensive effect of clophelin, with clophelin in combination with captopril and with no additional effect. It was found that the mechanism of action of hyperoxia on the circulatory system includes multiple components. In addition to influence on the adrenergic processes, activation of the angiotensin-converting enzyme is important, influencing the functioning not only of the angiotensin link, but also the opiate link of hemodynamic regulation. This mechanism is important both in the norm and with hypo- and hypertension. Figures 2; references 20: 10 Russian, 10 Western.
[1744-6508]

UDC 612.815.1+612.18+612.273

SIGNIFICANCE OF ADRENOREACTIVITY OF THE VESSELS IN MECHANISMS OF VASOCONSTRICTOR REACTION TO HYPEROXIA

Leningard FIZIOLOGICHESKIY ZHURNAL SSSR IMENI I. M. SECHENOVA in Russian
Vol 71, No 1, Jan 85 (manuscript received 12 May 83) pp 126-130

LEONOV, A. N. and FILATOV, A. V., Department of Pathologic Physiology (headed by A. N. Leonov), Central Scientific Research Laboratory (headed by E. G. Bykov), State Medical Institute imeni N. N. Burdenko, Voronezh

[Abstract] A study was made of the reaction of hemodynamics to hyperoxia as a function of the adrenoreactivity of the vessels. Studies were performed on 116 male white rats under nembutal narcosis. Hemodynamics and acid-alkaline

balance were studied under hyperbaric oxygenation with stimulation and blocking of postsynaptic α-adrenoreceptors. Series I studied the indices with acute hypertension and the effect of hyperoxia under these conditions. Series II studied the influence of α-adrenoreceptor blockage and hyperoxia with acute hypotension. Series III studied the influence of stimulation of α-adrenoreceptors and hyperoxia with acute hypotension. Series IV-VI studied hemodynamics in intact animals. Acute hypotension was caused by drainage of blood equal to 1.48 ± 0.36% of body mass three times within thirty minutes, decreasing blood pressure to 50 ± 5 mmHg. The pressor reaction to compressed oxygen under conditions of acute hypotension is formed without a significant change in acid-alkaline balance. P_{CO_2} in the blood remains elevated, and hypocapnia does not develop. This indicates previously unknown properties of compressed oxygen to restore adrenoreactivity of the vessels with liberation of α-adrenoreceptors from the inhibiting influence of metabolic acidosis. Figure 1; references 15: 10 Russian, 5 Western.
[1744-6508]

DIRECTIONALITY OF RECEPTION OF SOUND BY OUTER EAR OF DOG

Moscow BIOFIZIKA in Russian Vol 30, No 1, Jan-Feb 85
(manuscript received 16 Feb 84) pp 133-136

GORLINSKIY, I. A. and BABUSHINA, Ye. S., Physiological Institute imeni A. A. Ukhtomskiy; Leningrad State University imeni A. A. Zhdanov

[Abstract] The directionality of reception at the periphery of the auditory analyzer is important for detection and localization of a source of sound. The purpose of this work was to measure the variation in sound pressure at the entry to the outer auditory passage in dogs as a function of the azimuth of the sound source and estimate the influence of rotation of the outer ear on directionality of sound reception. Experiments were performed on two adult mongrel dogs utilizing a calibrated acoustical probe. Reception directionality patterns were measured at 0.5 to 40 Khz. Analysis of the directionality diagrams shows that for both lateral and frontal positions of the outer ears spatial selectivity of reception at the level of entry to the outer auditory passage increases constantly with increasing frequency. The maximum ΔI increases from 5 to 8 dB at 0.5-1.0 KHz to 24-29 dB at 20-40 KHz. Steepness of the curve of ΔI as a function of angle also increases with increasing frequency. Figures 2; references 7: 4 Russian, 3 Western.
[1741-6508]

MATHEMATICAL MODELING OF DYNAMICS OF INERT GAS TRANSPORT IN MICROCIRCULATION SYSTEM

Moscow BIOFIZIKA in Russian Vol 30, No 1, Jan-Feb 85
(manuscript received 3 Aug 83; after revision 19 Oct 83) pp 137-140

KISLYAKOV, Yu. Ya. and LUCHAKOV, Yu. I., Institute of Physiology imeni I. P. Pavlov, USSR Academy of Sciences, Leningrad

[Abstract] Mathematical models developed in previous works are used to analyze the influence of the physical properties of inert gases, blood circulation speeds in microscopic vessels and specifics of the morphology of the capillary bed on the dynamics of transportation of inert gases. A study of the model shows that the time of saturation of tissues is independent of gas content in the circulating blood. Diffusion properties of gases also have little influence on the dynamics of gas transfer in the tissues. In spite of the differing coefficients of diffusion of N_2, He and H_2, the rates of saturation of a cell by these gases at a capillary network density corresponding to that of the brain differs by 3 to 5 seconds. The diffusion resistance of the tissue thus does not determine its saturation time. Figures 3; references 8: 3 Russian, 5 Western.
[1741-6508]

PHYSICAL PRINCIPLES OF GENERATION OF NEUROMAGNETIC FIELDS

Moscow BIOFIZIKA in Russian Vol 30, No 1, Jan-Feb 85
(manuscript received 6 Feb 84) pp 154-158

VVEDENSKIY, V. L., KHARI, R., ILMONIEMI, R. and REYNIKAYNEN, K., Institute of Atomic Energy imeni I. V. Kurchatov, Moscow; Low Temperature Laboratory, Technical University of Helsinki, Espoo, Finland

[Abstract] A study is made of electrical processes at the neuron level leading to the appearance of magnetic fields which can be recorded by a magnetoencephalograph. Axons conducting nerve pulses are studied, representing the action potential as a combination of two current dipoles, one at the depolarization front, the other at the repolarization front. The dipoles are equal and oppositely directed and are calculated by integration of the intracellular current density with respect to cell volume. At present, synchronous activity of approximately 100,000 neurons is required to generate a measurable neuromagnetic field. Magnetic detectors are insensitive to many electrical processes in cells, such as intracortical propagation of pulses along axons, synaptic activity in disordered apical dendrites, or even activity in ordered dendrites on the external surfaces of the hemispheres. This fact is actually an advantage of magnetoencephalography, since it allows known types of processes to be differentiated from the general activity of the brain. Figures 3; references 10: 1 Russian, 9 Western.
[1741-6508]

UDC 616.45.-001 1/3-02:613.616.-008.9:546.26

PROTEIN METABOLISM IN CEREBRAL HEMISPHERES DURING EMOTIONAL-ALGESIC STRESS

Kiev UKRAINSKIY BIOKHIMICHESKIY ZHURNAL in Russian Vol 57, No 2, Mar-Apr 85 (manuscript received 19 Nov 84) pp 15-18

YAKUSHEV, V. S., DAVYDOV, V. V., BUSHUYEVA, V. V., SKURYGIN, V. P., KRISANOVA, N. V., MAKOYED, O. B., KURIPKA, V. I. and KAPTYUKH, R. F., Zaporozh'ye Medical Institute

[Abstract] Protein metabolism in cerebral hemispheres was studied during various periods of emotional-algesic stress on male Wistar rats. It was shown that such a stress leads to decreased levels of protein and to accumulation of free ammonia with definite toxic effect on the metabolism and functions of nerve tissue. The decrease in protein level is accompanied by activation of oxidative deamination of glutamic acid and proteolytic enzymes. The levels of DNA and RNA in cerebral hemispheres increased on the second day by 38 and 58% respectively. Thus, the emotional-algesic stress showed a definite effect on energy and protein metabolism in brain. This may be of great importance for normal functioning of the brain and lead to disturbances in higher nervous activity when the body comes under emotional stress. References 14: 12 Russian (1 by a Western author), 2 Western.
[1830-7813]

UDC 612.58:612.822.1.015.1:577.152.143

MONOAMINE OXIDASE ACTIVITY OF RAT BRAIN AFTER EXPOSURE TO COLD

Kiev UKRAINSKIY BIOKHIMICHESKIY ZHURNAL in Russian Vol 57, No 2, Mar-Apr 85 (manuscript received 11 Jun 84) pp 41-46

GOROSHINSKAYA, I. A., Rostov University imeni M. A. Suslov

[Abstract] The principal role in the reaction of the body to cold and in regulation of its adaptation to cold is played by the sympato-adrenal system. The goal of this work was to study the properties of monoamine oxidase A and B during cold stress, as well as K_m for serotonin deamination in rat brain mitochondria and supernatant fractions. During the cold stress, the K_m was found to increase more than 129%, while in the adpated animals it decreased by about 56%. It was shown that monoamine oxidase activity in mitochondria was lowered and it appeared in supernatant liquid leading to a conclusion that one of the mechanisms of enzyme inhibition during cold stress is some kind of disturbance in its bond to mitochondria membranes, so that the enzyme is leaked into the cytoplasm or that its catalytic properties must have changed. Figure 1; references 22: 14 Russian, 8 Western.
[1830-7813]

UDC 577.1:547.965:612.8.015

HOMOCARNOSINASE ACTIVITY IN BRAIN SEGMENTS AND IN KIDNEYS UNDER DIFFERENT REGIMENS OF HYPERBARIC OXYGENATION

Kiev UKRAINSKIY BIOKHIMICHESKIY ZHURNAL in Russian Vol 57, No 2, Mar-Apr 85 (manuscript received 29 Jun 84) pp 69-72

KRICHEVSKAYA, A. A., BONDARENKO, T. I., MAKLETSOVA, M. G. and USKOVA, N. I., Rostov University imeni M. A. Suslov

[Abstract] Activity of homocarnosinase (I) in various segments of rat brain was determined upon exposure to hyperbaric oxidation. The highest level of activity was found in the cerebellum, followed by medulla oblongata, midbrain, diencephalon and the lowest was in cerebral hemispheres. Kidneys also showed high activity of I. Exposure to 0.425 MPa of oxygen for 60 min led to increased activity of I in cerebral hemispheres (18.6%), midbrain (18.6%), diencephalon (56.6%) and medulla oblongata (40.6%); in cerebellum and in kidneys it dropped by 16.7 and 18.5% respectively. When the pressure was increased to 0.7 MPa, resulting in convulsions of the animals, no change of the activity of I was noted in cerebellum; however in the cerebral hemispheres, in midbrain and in diencephalon as well as in medulla oblongata it jumped to 158.5%, 141.5% and 161.1% respectively. This increased activity is probably a result of membrane breakdown. References 14: 8 Russian (3 by Western authors), 6 Western.
[1830-7813]

UDC 577.3:612.1

OXIDATIVE PHOSPHORYLATION IN RAT LIVER MITOCHONDRIA DURING ACTIVATION OF PEROXIDE OXIDATION OF LIPIDS

Kiev UKRAINSKIY BIOKHIMICHESKIY ZHURNAL in Russian Vol 57, No 2, Mar-Apr 85 (manuscript received 11 Jun 84) pp 79-81

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[Abstract] Effect of the activation of peroxide oxidation of lipids on the combination of oxidation and phosphorylation in rat liver mitochondria was studied. Intensity of peroxide oxidation (which was induced by immobilization stress and exposure to pure oxygen at 0.8 atm pressure) was estimated from the accumulation of malonic dialdehyde. In all tests the accumulation of malonic dialdehyde was increased due to the immobilization stress. Oxidative phosphorylation was also depressed: ADP/O coefficient was lowered by 33% and the rate of phosphorylation by more than two-fold. This experiment reproduced in animals the results obtained earlier in various models. References 10: 9 Russian, 1 Western.
[1830-7813]

UDC 612.822.1:615.832.9

EFFECT OF HYPOTHERMIA ON NEUROMEDIATOR CAPTURE WITH SYNAPTOSOMES

Kiev UKRAINSKIY BIOKHIMICHESKIY ZHURNAL in Russian Vol 57, No 2, Mar-Apr 85 (manuscript received 16 Apr 84) pp 87-89

BABIYCHUK, G. A., SHIFMAN, M. I. and MARCHENKO, V. S., Institute of Cryobiology and Cryomedicine; UkSSR Academy of Sciences, Kharkov.

[Abstract] Effect of moderate cranio-cerebral hypothermia on synaptic mechanism was studied on white male rats. One of the specific tasks was to explain the neuromediator capturing system by synaptosomes. A 1-6 hrs hypothermia course led to a lower capture of [^{3}H]-noradrenaline by synaptosomes from the cortex; no change was seen in hypothalamus synaptosomes. Cranio-cerebral hypothermia inhibited the capture of [^{14}C]GABA by both the cortex and hypothalamus synaptosomes. An assumption was expressed that, during the process of cranio-cerebral hypothermia, functional changes in metabolic and hormonal background take place in the brain leading to modifications in the capture process.
References 8: 1 Russian, 7 Western.
[1830-7813]

UDC 362.147:[362.145+614.27

IMPROVEMENT IN PROVISION OF MEDICINALS IN CONNECTION WITH NATIONWIDE PREVENTIVE MEDICAL EXAMINATION SYSTEM

Moscow FARMATSIYA in Russian Vol 34, No 1, Jan-Feb 85 (manuscript received 27 Dec 83) pp 8-10

[Article by G. Ya. Orlean, T. P. Klimovich and L. K. Pebalg, LaSSR Ministry of Health, Riga: "Improvement in the Provision of Medicinals in Connection with a Nationwide Dispensary System"]

[Text] In a socialist society, the maintenance of the health of the workers has indeed become a nationwide affair. A basic law of the USSR places responsibility for the health of the Soviet people and the improvement of their working conditions and living conditions in the rank of the constitutional activity of the government. It was noted at the June, 1983 Plenum of the CPSU Central Committee that public health problems will occupy an even greater place in social politics. Special attention is paid to the prevention of illnesses, and one of the methods is the introduction of annual prophylactic examination of the whole population. The problem posed of conducting an annual prophylactic examination marks a new important step in the development of Soviet public health, the basic goals of which are the prevention of illnesses, the lowering of morbidity and the maintenance and improvement of the health of the workers. Nationwide annual prophylactic examinations will be accomplished through a whole network of ambulatory-polyclinic institutions for a single program, which involves two steps for carrying it out. The first step must be a period of activation of all directions of dispensary work and the introduction and development of the most efficient forms of its organization. The most important task of the second step will be a further increase in the efficiency of the dispensary system and expansion to nationwide coverage. Successful solution of this important social-economic problem in many ways will promote proper, clearly organized, operational and dependable provision of medicinals for the population. A systematic increase in the arsenal of medicinals and ready availability of medicines and drugs involves a rise in the implementation of medicaments and products having a medical purpose. Therefore, maximally complete and objective information about the organizational and economic directions of the activity of pharmaceutical institutions becomes more and more valuable, the development and study of which becomes a difficultly-soluble task without the use of computer technology. The "Planning Provision of Medicaments and Management of the Pharmaceutical System" subsystem devised in the GAPU [State Pharmacy-Patent Administration] system of the republic confirms the importance and necessity of this task. A single

information base of the subsystem devised simplifies substantially contacts between the GAPU and its divisions, on the one hand, and the pharmaceutical network within its jurisdiction--on the other hand, and hence, also the provision of medical institutions and the population with a necessary assortment of medicinals and other medical products.

In the course of annual prophylactic examination of the population, with allowance made for the increase and change in volumes of demand for different kinds of medicinals, correct planning and forecasting of the demand for medicaments are among the most important elements in medical provision management. Therefore, special attention will be paid to the development and further improvement of the set of tasks of the subsystem, "Planning the Demand for Medicinals and Setting up a Multiple Application-Order". This set of tasks provides a scientifically sound estimation of demand for medicinals based on statistical indicators of their implementation. For purposes of improving the provision of medicinals for the people and also attaining active action against suppliers who do not fulfill delivery plans, a set of tasks, "Control of Planned Deliveries of Medicinals", has been developed. Great attention is being paid to improving information about medicinals. And here also the computer has paramount value. A reference system on the presence of medicinals in the pharmacies of the city contributes to an improvement in the quality and an increase in the work efficiency of the information service of the GAPU system of the republic and also to solution of the basic task facing the pharmaceutical service--timely and reliable provision of the population with medicinals. Thus, the use of automation improves the provision of information to public health organizations and therapeutic-prophylactic and pharmaceutical institutions and provides timely processing and analysis of current information.

The chief administrator plays an essential role in the proper organization of the work of a pharmacy, the whole activity of which is directed to the provision of an organization of accurate work of all segments of the pharmaceutical institution with reliable medicinal service for the population. The chief administrator is obligated to take measures for a timely medicinal supply for all patients who have been directed to the pharmacy, to maintain a constant relationship with the information buros of the pharmacies of the city and ambulatory-polyclinic institutions, which are responsible for conducting dispensary service for the population, to keep track of the maintenance of medicinal preparation times, to aid the primary and timely servicing by medicinal means of invalids, World War II participants and children under one year of age.

By fulfilling the tasks set by the party and the government, including measures for improving the quality of the medicinal supply of the population, the GAPU collective of the LaSSR Ministry of Health directs its work toward raising the skill classification of pharmaceutical workers and for this purpose regularly conducts studies with practicing workers of the pharmacy to accelerate the introduction of the new achievements of pharmaceutical science into practice.

The implementation of a broad progressive program of Soviet medicine assumes the conversion of the care of the health of the population into a single socialist, economic and humanistic goal of a developed socialist society. It was noted at the 26th CPSU Congress that "It is necessary to do everything so

that Soviet man always and everywhere can obtain timely, qualified and sensitive medical help." These words were accepted by the workers of the LaSSR Ministry of Health as a guide for action.

12410
CSO: 1840/1853

FIGURES AND FACTS ABOUT HEALTH CARE IN USSR

Moscow POLITICHESKOYE SAMOOBRAZOVANIYE in Russian No 3, Mar 85 pp 129-130

[Text] The right of citizens of the Soviet Union to health care is fixed in the USSR Constitution. It is provided through free medical care, which is rendered to the public by state health care institutions.

In capitalistic countries, a person's health usually depends on the contents of his wallet. For example, in the United States, in 1983, a patient paid $190 per day for a private hospital room, $85 for 0.5 ℓ of tranfused blood and $720 for an x-ray examination. That same year, in England it cost about 20 pounds sterling (the price of a pair of shoes) to write a prescription in a private clinic.

Medical care is growing increasingly expensive in capitalist countries. For example, its cost increased by 34% from 1981 to 1983. The desire of medical corporations to earn more from patients often results in having treatment ordered that was not validated by medical indications, but motivated by the desire to get a patient in their hands. According to reports of the American press, at least 3 million unnecessary operations per year are performed in the United States (as a result, the hospital industry earns a profit in excess of 3 billion dollars).

In our country, direct government expenses under the item of "Health care and physical culture" constituted 16.5 billion rubles in 1983. Funds spent under several other items of the state budget also "work" for the health service. In particular, we refer to funds allocated for improvement of working and living conditions, environmental protection, development of medical science and personnel training.

There is another source of funds spent on health care, the social security and social insurance fund, which is made up of funds of the state budget, state, cooperative, trade-union and other public enterprises and organizations, and kolkhozes. In 1983, it constituted 55 billion rubles. Benefits related to temporary disability due to illness and parturition, as well as care of a sick child, are paid from this fund.

Organization of hospital care requires the largest capital. About two-thirds of the budget allocations for health care is spent on this. In 1983, mean state expenditure to start up one hospital bed constituted 8911 rubles. At

the present time the state spends more than 10 rubles per day to keep one patient in a hospital.

The health service of the Soviet Union consists of more than 23,000 hospital facilities, 37,700 different outpatient-polyclinic medical institutions that take care of the public, according to 1983 data. There are about 3.5 million hospital beds in the nation, or 128 beds per 10,000 population. This is the highest indicator in the world. Our health care system also includes a widespread network of emergency medical care (which helps almost 90 million victims and patients per year). In addition, our public health system includes hundreds of scientific research institutes and centers, higher and secondary medical educational establishments (at the present time, there are more than 600 secondary, about 100 higher educational establishments, as well as 17 institutes for advanced training of physicians, which train medical personnel).

In 1983, there were more than 14,000 sanatoriums and other health facilities in our country (not counting those for 1-2-day stays). They can take care of almost 2.3 million people at the same time. Each year, more than 60 million workers go there to improve their health and to rest. In some health facilities, aftertreatment is organized for patients following hospital stays. For example, 72% of the patients who had myocardial infarction and spent time in sanatoriums returned to work after 4 months.

The main asset of the Soviet public health service is its personnel. According to data for 1983, in our country there were more than 1.1 million physicians in all specialties and more than 3 million paramedical personnel (feldshers, nurses, midwives and laboratory technicians). The USSR is in first place in the world with respect to number of physicians for the public. In 1983, we had 40 physicians per 10,000 population (versus 24 physicians in the United States, according to data for 1980).

Soviet physicians take care of 3.3 million people treated in hospitals and clinics and see almost 10 million in their offices at walk-in centers and polyclinics per day. The emergency service responds to more than 219,000 calls. Surgeons perform over 20,000 operations. Soviet physicians deliver almost 15,000 babies daily; they perform about 4 million biochemical, x-ray and other tests for preventive and diagnostic purposes.

In prerevolutionary Russia there were only nine consultation centers for women and children. By 1940, the number of women's consultation offices, children's polyclinics and walk-in offices were brought up to 8600 in our country, and in 1983 there were already 27,000, or 3 times more than in 1940. At the present time, virtually all women are provided with medical care during parturition versus slightly over 5% before the revolution.

The network of children's hospitals is constantly growing. In 1983, there were 584,900 hospital beds for children (260,100 in 1960, 89,700 in 1940). Medical care of children is directed largely toward disease prevention.

Soviet trade unions display much concern about children. At the present time there are about 70,000 Pioneer camps in our country, which are attended for vacations by over 16 million children. The trade unions also have

specialized Pioneer sanatorium camps, which operate the year round, where children are not only treated, but continue with their studies. The first rest homes for parents with children were opened in 1972, and at that time they accommodated 25,000 people. In 1983, there were 368 such rest homes and boarding houses with space for 133,000. It is planned to bring the number of places in such rest homes to 160,000 by the end of the current five-year plan.

One of the most important tasks for the present and the immediate future is to upgrade medical care of the rural population and bring it closer to the urban level. At the present time there are more than 277,000 physicians and more than 1 million workers with secondary medical education working in rural areas. According to data for 1983, there were 7000 independent walk-in centers and polyclinics in rural areas, which could see almost 1.9 million patients per shift. In addition, there were 88,000 feldsher-midwife centers, 11,400 children's polyclinic departments and 7200 women's consultation centers. Rural hospitals have over 1.2 million beds, which is more than 34% of the total bed resources of our country. There are almost 400 hospital beds per rural rayon as the average in the nation, while the capacity of polyclinics constitutes over 412 visits per shift. At the present time, 90% of the rural population undergoes examinations and treatment without traveling beyond the limits of their rayon. Oblast hospitals, which usually have at least 1000 beds at the present time, are manned by a staff of physicians in about 50 specialties, who are proficient in all modern diagnostic and therapeutic methods.

It is planned to expand the network of outpatient polyclinic institutions in order to improve medical care of the rural population and to upgrade it. In 1983-1985, 1950 walk-in centers with a total capacity of 180,000-195,000 visits per shift will have to be built. It is planned to start up 5200 such institutions under the 11th and 12th five-year plans.

At present there are over 4000 emergency stations and departments in the nation's rural regions. Their number increased by over 4 times in the last decade. It is planned to assign 16,000-17,000 physicians annually to rural areas to upgrade medical care in these areas and to provide a full staff in rural hospitals, walk-in and polyclinic institutions.

Recently, much attention has been devoted to strengthening and improving the outpatient-polyclinic service, which is the zone of the patient's first contact with medicine. At present a number of measures are being implemented to organize the operation of walk-in centers and polyclinics in such a way as to reduce to a minimum the time spent by patients waiting to be seen by a physician and so that the physician will have the opportunity to devote maximum attention to each patient.

New preventive departments started to be opened at many polyclinics. They perform preliminary examinations on all those who come for help, as well as preliminary tests, so that the physician to whom the patient has come could rapidly receive objective data about his condition. For the time being, there are about 400 such departments, but in time they will be opened at all polyclinics.

The CPSU constantly guides health care workers toward improving the quality and sophistication of medical care, which are not always consistent with modern requirements. It is particularly important to overcome these flaws in view of the goal advanced by the party, that of providing annual dispensary care of the entire population. The USSR Ministry of Health has outlined and is implementing steps aimed at reaching this goal. None of the health services in the world had ever formulated such a difficult task. Much has already been done in this direction. In 1983, 117.2 million people underwent periodic medical examinations. That same year there were 58.4 million people under dispensary observation (26.8 million in 1970). All this helps prevent diseases and safeguard people's health.

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CSO: 1840/301

HEALTH-IMPROVING MEASURES FOR WORKERS IN SIBERIA

Moscow TRUD in Russian 19 Apr 85 p 2

[Article by Yu. Borodin, chairman of the Presidium of the Siberian Department of the USSR Academy of Medical Sciences, Novosibirsk, "The Physician's Allies. Implementation of Integrated Program of 'Man's Health in Siberia'"]

[Text] An individual who hears physicians appeal to him to safeguard his health usually has thoughts something like: "Since it is my health, I can do as I please, waste it if I wish, spare it if I wish." However, it is not in vain that it is said that man's health is the state's asset. A decline among industrial workers alone in morbidity by one day yields an additional 32.5 million work days per year in the nation. This is tantamount to a full work year for several groups of workers of major enterprises. Not to mention the money that could be directly saved, since health care is free in our country for the patient, but not for the state.

In our opinion, it is high time to reject the conception that a man's health depends only on physicians. Indeed, we can invent another thousand drugs, hundreds of methods of treatment, but still we view something else that would enable us to achieve a perceptible result. The scientists in the Siberian Department of the USSR Academy of Medical Sciences, proceeding from current conceptions of human ecology, anthropoecological stress and fatigue, have developed the conception of assuring safety to life and health under specific living conditions.

The substance of this conception is that emphasis should be placed on other that purely medical measures. Let me give a somewhat simplified example. Last winter was one of the most rigorous of the past few years in Siberia. With onset of cold weather there was drastic reduction in vehicular traffic in cities. Many people, who were overexposed to the cold while waiting for a bus or trolly at temperatures of -30 to -40 degrees, wound up in a hospital bed. As you see, physicians had nothing to do with this.

There are many elements to man's life support. We refer to natural elements--soil, air, water, climate, flora and fauna, the electromagnetic "environment." There are also technical elements--industrial resources, means of processing them and the end product (raw materials and intermediate products), industrial and agricultural enterprises, transport, trade and municipal service enterprises, etc. There are biosocial elements--family, group. In this aspect,

methodological recommendations have been prepared for development and implementation of integrated special-purpose "Health" programs of a regional and departmental nature, which embody the idea of systems control of public health and status of the environment. This direction is being actively developed at the Institute of Integrated Problems of Hygiene and Occupational Diseases, as well as the Institute of Clinical and Experimental Medicine of the Siberian Department of the USSR Academy of Medical Sciences.

Participation of specialists in different disciplines, different ministries and agencies responsible not only for satisfying man's physiological and biological needs, but the set of his material and spiritual needs, is required for implementation of the integrated "Health" program.

The new conception was successfully tested by the scientists in the Siberian Department, together with party and soviet agencies in implementing the program of "Five-Year Plan for Health in Norilsk Industrial Rayon." The conventional economic effect of fulfilling the first part of this program under the past five-year plan constituted 14 million rubles. In recent years, morbidity has declined in this rayon: by 36% for pneumonia and 19% for ischemic heart disease. Yet these diseases are considered typical for people who live in the north. At the initiative of the Central Committee of the trade union of workers in the metallurgical industry, the experience gained in implementing the "Health" program at the Norilsk Mining and Smelting Combine is being extended to ferrous and nonferrous metallurgical enterprises. An interagency council for development and introduction of special-purpose "Health" programs was established under the Central Committee. Republic-level headquarters have been opened in the Ukraine and Kazakhstan, oblast- and plant-level ones have been opened in many cities.

The new conceptions served as the basis also for the integrated program "Human Health in Siberia." Development of this enormous region is made difficult by the rigorous climate. It is not always possible to use the refined technology for recovery of mineral resources which, in turn, affects the health of miners. The specifics of life in Siberia determined the basic directions of implementation of the program.

Scientists were particularly concerned to safeguard the health of groups of workers. Industrial workers have already received suggestions on optimum organization of labor safety at enterprises and environmental protection. For example, at the present time, the special program of "Health of Metallurgical Workers" is being successfully fulfilled in West Siberia. Recommendations have been issued on integrated preventive measures for workers in the coal, mining, petrochemical industries and instrument building. Modern methods have been introduced, which were developed at Academy institutes, which have improved significantly the quality of mass scale physicals and their efficiency, since all preliminary diagnostic work was done by automated systems and computers.

The work of specialist-physiologists played a major part in optimum distribution of manpower resources in Siberia. Guidelines have been developed and introduced for the watch method of work in areas undergoing new industrial development (West Siberian Territorial Industrial Complex, Tomsk Oblast, BAM [Baykal-Amur Railroad]). The scientists' recommendations on occupational

screening, working and recreational conditions served as the basis for organizing work at many enterprises in the petroleum and gas provinces of the North Ob River region. In Novosibirsk, recommendations on improvement of working and living conditions for workers were included in the plans for economic and social development of the Sibsel'mash [Siberian Agricultural Machinery] and Sibtekstil'mash [Siberian Textile Machinery] associations, and the Metallurgical Plant imeni Kuz'min.

In order to establish a system for controlling public health, it is mandatory--as we became convinced as a result of comprehensive studies--to have a socio-hygienic passport system of health care for each region. Today, the scientists of the Institute of Combined Problems of Hygiene and Occupational Diseases have developed such passports for Altay Kray, Novosibirsk and Tyumen oblasts and Tuva ASSR. There, extensive use is being made of our integrated maps of features of the atmosphere, water resources, climate and meteorological conditions and indicators of public health status.

One of the elements of the life-support system for the public is directly related to research aimed at implementation of the Food Program. For example, at the present time agricultural products are transported to the polar region without due consideration of their benefit for the inhabitants of expressly that region. In essence, primarily products in demand in the mainland are brought there. Does this assortment always correspond to the elementary requirements as to trace element composition?

In our opinion, one should proceed more boldly in advancing to the North hothouse farming, expanding the assortment of agricultural crops. Then it would be sufficient to import from the mainland only the components that are missing from the assortment of locally raised products. In order to properly organize the food base of different Siberian regions, the scientists of the Siberian Department of the USSR Academy of Medical Sciences made an economic and geographic evaluation of agricultural resources of Tyumen Oblast and Altay Kray. Recommendations were issued for optimization of the assortment of crops and structure of farm products.

Many years of investigation of the physical condition of healthy people (indigenous and immigrants to Siberia) confirmed the hypothesis that man is rather sensitive to changes in solar activity and meteorological factors, disruption of cycles of biorhythms of the human body when there is a drastic move, for example, to West Siberia from contrasting climate zones--Azerbaijan, Belorussia and the Ukraine. The results of these studies served as the basis for theory of medical heliometeorological forecasting. Many medical institutions of Norilsk and Novosibirsk now make use in their work of current and long-term summaries of medical forecasts of solar activity. In essence, this is nothing other than forecasting the physical conditions of patients in accordance with changing environmental conditions.

If a physician knows about these changes in advance, he can prevent exacerbations of diseases and help a patient calmly endure atmospheric perturbations. The effect is obvious: considerable reduction of industrial traumatism and in number of visits to emergency care facilities. Recently, surgeons have also made use of these reports to schedule surgery in accordance with the helio-meteorological forecast.

N. A. Semashko, first people's commissar of health, said: "Prevention must be viewed broadly and deeply, as a concern of the Soviet government to strengthen the health of the Soviet people, and not as a narrow departmental task for health care agencies." We were governed by expressly this idea as we developed the "Man's Health in Siberia" program on the basis of new conceptions. However, it must be conceded that we still encounter rather often administrators on different levels who believe that health of the people is the concern of only physicians. For this reason, successful implementation of our programs depends largely on how fast we shall be able to overcome this psychological barrier.

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CSO: 1840/300

UNIVERSAL HEALTH DAY 1985 GOAL OF RAISING HEALTHY CHILDREN

Tashkent PRAVDA VOSTOKA in Russian 7 Apr 85 p 4

[Article by P. Chichenin, candidate of medical sciences, chief of Department of Health Care and Social Security, Business Administration of the Uzbek Council of Ministers, "The Young Must Be Sturdy"]

> [Text] Today is Worldwide Health Day. This year, "Healthy Young People Are Our Best Successors" is the slogan for Health Day.

The capabilities of the socialist health care system are being disclosed more and more in our republic. Last year, the number of beds in hospitals increased by 8000. Today, there are 32 physicians and about 90 paramedical personnel per 10,000 population. Each year, physicians undergo primary specialization, receive advanced training at large clinical hospitals and scientific research institutes.

The foundations for good health and longevity are laid in infancy. In Uzbekistan, much attention is devoted to organization of pediatric care. A third of the funds allocated by the state for health care, 900 million rubles, was earmarked for mother and infant health care during the current five-year plan. This is twice as much as for the preceding five years. At the present time, there are more than 1200 children's consultation centers and polyclinics, and 85 children's hospitals in this republic. In the last 3 years, total hospital beds for children increased by 30%.

A wide network of therapeutic and preventive institutions situated close to the residences and schools of patients is rendering effective medical care to adolescents. It includes specialized adolescent offices, as well as health centers, stomatological offices located at educational establishments. Their work is administered by republic, oblast and city adolescent centers. Consultations by physicians at the republic adolescent center are furnished in more than 35 specialties.

This republic's ministry of health is concerned about manning adolescent offices with well-trained personnel, and their specialization is being refined. This makes it possible for each school child to acquire a modicum of knowledge about hygiene and medicine, in accordance with school reform.

Classtime and extracurricular measures pertaining to health education are being implemented actively in this repulbic's schools. They are closely integrated with the content of syllabuses. Much is being done in secondary vocational-technical schools. Work has been done to improve the sanitation and upkeep of classrooms and work shop facilities at vocational-technical schools, as well as the study and work loads of future workers, organization of their everyday life, nutrition, physical education and medical care.

More than 1.6 million children and adolescents spent the summer in Pioneer and school camps, tourist-excursion bases and traveled to resorts with children's institutions. Much was also done to improve the health of students. Last year, dietetic meals were provided for about 7000 people, 1850 were referred to rest homes and 1000 students underwent sanatorium and resort therapy.

The 21st century is not so far away. Today's young men and women, adolescents and children will live and work then. And our main task is to do everything we can so that the young generation will grow healthy and happy.

10,657
CSO: 1840/291

IMPROVED HEALTH CARE PROMOTES HEALTHFUL LIVING

Moscow PRAVDA in Russian 26 Mar 85 p 3

[Article by Professors O. Shchepin and G. Tsaregorodtsev appears under the rubric "Concern of Each and Everyone: Health Service"]

> [Text] Soviet public health care may rightfully be proud of its achievements. The USSR is far ahead of most economically developed countries in providing the population with physicians (one physician for 250 residents). The average lifespan during the years of Soviet Power has more than doubled, and the overall mortality rate has dropped by a factor of almost three, and infant mortality by a factor of ten. Now, our public health care has a powerful material and technical base at its disposal.

However, the qualitative level of public health care still is far from always meeting the growing demands of the Soviet people.

The strategy of developing public health care for the eighties was defined by the decisions of the CPSU 26th Congress and the party and government decrees. The realization of this strategy requires extensive utilization of the achievements of scientific-technical progress, a widened scope of prophylactic activity, introduction of an annual preventive medical examination for all the population and active implementation of medico-sanitary measures, ensuring the fulfillment of the demographic policy worked out by the party.

The complex program, worked out in accordance with the decree of the CPSU Central Committee and USSR Council of Ministers on "Supplementary Measures for Improving the Population's Health Protection" provides for the establishment of work and living conditions that are most favorable to health and have a positive effect on the way of life.

The introduction, by stages, of an annual preventive medical examination for all the population is of great social importance. Such

an examination allows for active monitoring of the state of health of all layers of population and for active detection of diseases in their early stages. Much attention will be given in practice to healthy people.

A physician should not be limited by the statement that a given person is healthy. His goal should be to improve and strengthen health and to maximally maintain work activity.

The change from safety engineering to safe technology is the most promising labor protection. A considerable part of the means, unfortunately, is still used to mitigate or remove the aftereffects of unfavorable work conditions and not to eliminate their initial causes. Scientific-technical progress should be directed at maximal consideration of the physiological, psychoemotional and aesthetic needs.

In the certification of work places, consideration of the amount of technical equipment and the degree of conformity to modern scientific-technical and technological achievements is not enough. Each work place should be thoroughly studied from a sanitary-hygienic viewpoint.

The experience of many medical and sanitary units shows that the complex plans for therapeutic and health improvement measures play an important role in the drive to reduce the sickness rate. These plans are complex not only because they include a wide range of problems, but because representatives of the administration, trade unions and other social organizations participate in their solution. For example, a general plant medical-engineering brigade for health improvement of work conditions and reduction of the sickness rate operates at the Chelyabinsk Tractor Plant. The members of this brigade study the causes of the general and occupational sickness rate, traumatism, state of safety engineering, technological processes and work organization; and, they develop recommendations for the mechanization and automation of production processes as well as monitor the organization of public catering, preventive medical examinations and other activities.

In summing up the results of socialist competition together with the production indicators, the sickness rate with the temporary loss of work fitness, the level of traumatism and other data, characterizing the health improvement work, should be considered more extensively.

Development of a healthful way of life is a problem that concerns not only the health protection bodies. If people would systematically observe basic hygiene requirements, this would raise the health level of the population incomparably more than the most important achievements of medical science. It is expedient that social influence be focused on persons who are alcohol abusers and on drives

against other harmful habits, which worsen health and reduce work fitness.

Self-education plays an important role: man can learn to do healthful things easily, so that this may even be pleasurable for him. And, on the other hand, he must suppress desires whose satisfaction is unfavorable for his health.

The development of sensible needs is of special importance. Medicine contributes to improvement of the population's way of life by developing hygiene standards for nutrition, work and rest.

For example, in putting together a menu for a dining room, it would be helpful to indicate the calorie count of a given dish opposite its listing. In turn, each person should know his optimal number of food calories. It is also recommended that the labels on food products give a short description of the energy and chemical values of these products. All this would contribute to incorporating the principles of balanced nutrition, an important precondition for strengthening of health.

A rational, healthful way of life is a necessary condition for successful social-hygienic adaptation, that is, adjustment of man to the fast and often stressful tempos of modern life. This way of life helps us to overcome some of the negative consequences of scientific-technical progress, by directing us to the most sensible, in terms of hygiene, use of material wealth and the correct use of time.

The brigade method is spreading widely to all sectors of the national economy. The brigade could become an advocate of health and safe working conditions, a transmitter of a healthful way of life, hygienic practices and habits, and a shield against drunkenness and alcoholism. The initiative of the distinguished Moscow brigade leader-construction worker, Hero of Socialist Labor A. Basov, as expressed in "Highly Productive Work Without Traumas and Accidents", deserves wide support. In the complex program of plans for increasing the prevention of diseases and strengthening the health of the population, special attention is focused on the perspective planning of health improvement measures in all sectors of the national economy, territorial-production complexes, enterprises and institutions. The trend toward prevention must be sharply accelerated in the work of polyclinics, hospitals, sanatoriums, rest homes and in the activity of scientist-medics, in the education of future physicians and middle-level medical workers, and organizers of physical culture and sports. Shouldn't a united coordinating center be established to scientifically work out the problems of prevention, healthful way of life, and the hygienic education of man?

More effective use of certain legal mechanisms would also be worthwhile. For example, it would be useful to encourage and stimulate people, who constantly lead a healthful way of life and thereby do not lose any working time due to illness. Several paid days could probably be added to their regular vacation. It appears expedient to extend everywhere the use of a wage increase to pediatricians and other workers in nurseries and kindergartens that depends on a reduction of sickness rate for children and a corresponding decrease of lost work time for mothers who care for the sick children.

Those who suffer traumas in a drunken state, on the other hand, deserve financial punishment. Isn't it fair to make them pay completely or partially for the cost of treatment, especially in the case of hospitalization? Those patients who maliciously and systematically disobey physicians' orders while on sick leave should also be required to pay. Legal measures are also needed in cases of stenocardiac attacks, acute hypertension crisis, myocardial infarctions, serious psychoemotional and other disorders that appear due to rudeness, tactlessness and bureaucratic indifference. It appears that some sort of rights must be granted to emergency medical aid physicians so that they can contest unfounded, false calls.

The well known Roman philosopher Seneca used to say that "We are not granted a short life, but we make it so..." A neglectful attitude toward one's own health is a neglect of society's interests as well. People with such an attitude are sick more often (receiving paid sick leave), become invalids more frequently, and often retire earlier (due to sickness).

The right to health and the responsibility to organically preserve and strengthen it merge. Here, social and individual [responsibility] appear in a dielectical unity. Without a responsible attitude of all citizens toward this important matter, even the highest expenditures for health care and the most important achievements of medicine will not produce the desirable result.

Of course, it is wrong to consider the health of man as some end in itself. Some people may form a hypertrophic idea about it with the growing role of health onthe scale of social priorities. A sense of proportion is needed here as in everything else.

The personal happiness of man and his social significance consist of many components. Health is one of the preconditions for the harmonious development of man, one of the important conditions for his optimal manifestation in work and social life.

Health is becoming increasingly an integrated indicator of social progress. And, its level, in an increasingly greater proportion, depends on the well planned and coordinated activity of the health care bodies and the party, state, economic, trade union and other social organizations, whose concern for the health of the Soviet people has become a united, sociopolitical, economic and humanistic task.

12525
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MEANS OF PROVIDING MASS SCALE DISPENSARIZATION FOR ORGANIZED POPULATION

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 3, Mar 85
(manuscript received 24 Apr 84) pp 23-26

[Article by V. M. Udod, P. Kh. Andrun' and N. V. Kapralov, Tselinograd Medical Institute]

[Text] The decisions of the 26th CPSU Congress, June and December (1983) plenums of the CPSU Central Committee put to public health agencies the task of activating extensive preventive work. One of the means of performing it is annual dispensary care of the entire population. The transition of such care to a new phase signifies introduction of new achievements of preventive medicine in a unified sociomedical process. There will be new solutions to many organizational and methodological problems, introduction of new forms of work and improvement of extramural care [10]. The group of employable people, as well as individuals with diseases that are the cause of significant disability and temporary absenteeism, are to be placed under dispensarization supervision first.[Dispensarization = preventive medical examination].

The diseases include those of the digestive organs; about 10% of all cases of such pathology are diseases of the stomach and most of them are preneoplastic.

As shown by experience, the decline in incidence of cancer of the stomach was due primarily to early detection and active treatment of peptic ulcer, gastric polyps and gastritis [2, 3].

At the present time, there are still no simple and readily accessible methods of examination for detection of chronic diseases of the stomach and duodenum [1]. There are several informative diagnostic methods for diseases of digestive organs--early x-rays, laboratory, fibroendoscopic and other tests. But it is time-consuming, uneconomical and inexpedient to perform the entire set of complicated instrument and laboratory tests on a large scale in mass screening of the public [8]. For this reason, it is a pressing task to develop a method of singling out of the many essentially healthy individuals the groups at risk, for whom in-depth examination of the upper digestive tract is indicated.

Early and active detection of chronic diseases of the digestive tract should be performed as close as possible to work places, with use of highly informative

simple diagnostic tests. In our opinion, this is impossible without automating information processes.

The most economic and effective method of picking up the risk groups is automated screening, which has been developed in our country and abroad, and which involves screening by means of questionnaires for people with suspected disease [4-7, 9, 11].

Use of questionnaires makes it possible to rapidly cover an enterprise group numbering many thousands without leaving the job, as well as to obtain information about the health status of each worker and the group as a whole.

Together with the Central Scientific Research Institute of Gastroenterology, we developed a system of automated screening-interrogation which makes it possible to pick up individuals in a risk group for the purpose of subsequent in-depth examination, as well as patients with chronic pathology.

The system of automated two-stage detection of diseases of the stomach and duodenum was used to screen workers at the Tselinogradsel'mash [Tselinograd Agricultural Machinery] Association in Tselinograd.

At the first stage of the preventive examination of 6437 workers, we performed automated screening using a specialized questionnaire. It consisted of highly informative, laconic and simple tests suitable for mass use, which made it possible to clearly isolate the group of individuals with mild symptoms of disease. In all, 26 tests with 85 standardized answers are used, which reflect identification data about the subject, history, bad habits, diet, detailed description of pain syndrome, group of dyspeptic complaints, results of prior laboratory and instrument tests, etc. Each tag is rated in points (0 to 8) according to its diagnostic significance.

The obtained screening-questionnaire information was processed on a Minsk-32 computer. The printout reflected lists of those questioned ranked according to diagnostic condition ("health," "stressed," "sick") and number of points accumulated.

At the second stage, the "positive-screening" individuals were submitted to an in-depth clinical, laboratory and instrument examination, which included endoscopic examination of the upper gastrointestinal tract.

The computer was used not only to screen individuals requiring special instrument and laboratory examinations. It was possible to program in each specific case the sequence, type and order of diagnostic measures.

As a result of this work, 342 workers were picked up for the first time with pathology of the gastroduodenal system, who had not been on the dispensary rolls before. The diagnosis of peptic ulcer was made in 61 cases, gastric polyposis in 16, various forms of gastritis in 230 and other diseases of digestive organs in 33. Malignancy of the gastric mucosa was found in two patients. Of the screened patients, 198 were placed on the dispensary rolls at the medical section of the association with concrete recommendations, in

accordance with the diagnosis, stage and duration of pathological process, and for the other 144 it was recommended that they have an annual check-up. Some of the screened patients (46) were hospitalized in the clinic and submitted to conservative (24) and surgical (22) management.

Computer processing of this information also made it possible to summarize data about bad habits, diet, emotional and physical stress factors in individuals of different age, sex, occupation, shop. On this basis, health education work aimed at elimination of risk factors was optimized in the group of workers.

The automated system of active screening of workers operated without taking them away from their jobs.

The main diagnostic tests for the risk group (x-rays, intragastric pH measurement, endoscopy with multipole special biopsy) were performed at the shop medical centers before the start of the work shift.

Thus, the system of automated screening of individuals in an industrial association makes it possible to detect those subject to in-depth examination without removing them from the work process, within a short period of time and with scientific validation, which helps in the early detection of chronic diseases of the stomach and duodenum. The system makes it possible to automate the most time-consuming stages of preventive check-ups and to cover in a short time a large group, as well as promptly place on the dispensary rolls or treat under hospital conditions those with pathology of the upper gastrointestinal tract. This method reduces the time required to examine the public, improves the quality of diagnostication, saves time and effort for medical workers and lowers the number of days of disability.

The system we developed will help perform the task of providing dispensarization services to the entire population.

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10,657
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ORGANIZATION OF MASS-SCALE PREVENTIVE EXAMINATIONS FOR DETECTION OF ARTERIAL HYPERTENSION

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 3, Mar 85
(manuscript received 23 Jul 84) pp 29-30

[Article by R. T. Libenzon, V. I. Shtatnyy, L. N. Yermakova and I. B. Prozorskaya, Vladivostok Medical Institute]

[Text] Further improvement of Soviet health care is closely linked to solution of problems of prevention and treatment of cardiovascular diseases, which are one of the most important medical and social problems of our times.

Mass-scale preventive screening, organization of which must be upgraded constantly, occupies a special place in the set of preventive measures aimed at preserving and strengthening public health.

Mass-scale preventive examinations, the purpose of which is to detect arterial hypertension (AH) and ischemic heart disease, provide a clear idea about the incidence of these diseases, which is the basis for preventing them as well as development of complications.

The All-Union Cardiological Research Center (VKNTs of the USSR Academy of Medical Sciences) developed a program for control of cardiovascular diseases, including AH, among industrial workers.

Since 1978, Vladivostok Medical Institute has been a participant of the cooperative program for "Control of Arterial Hypertension Among Industrial Workers."

The purpose of this program is to lower cardiovascular morbidity and mortality by means of active control of AH. The basis of the program was active detection and treatment of patients for a long period of time.

Intern-students, internists and medical interns were involved in the mass-scale preventive examinations. They had all first been trained in strictly standard measurement of arterial pressure (BP) and filling out a questionnaire on "Chest pain during physical exercise."

Individuals in all age groups employed at ship-repair enterprises were examined. Before starting the examinations, there were preparations, which

included making lists of blue- and white-collar workers subject to screening, elaboration of examination schedules together with enterprise management, preparing primary, second and future examination cards.

The primary examination was performed by a standard method and consisted of recording identification data, eliciting the personal and family history, questions aimed at detection of stress angina pectoris, and attention was given to history of essential hypertension, regularity of its treatment and drug intake. Then BP was measured by the method proposed by VKNTs (BP was measured in seated position on the right arm with a Korotkov mercury sphygmomanometer, twice at a 5-min interval, with a margin of error of 2 mm Hg); evaluation took into consideration the mean of these 2 readings.

In all, for the period in question, the institute staff examined 24,000 men--blue- and white-collar workers at industrial enterprises. At one enterprise, about 3000 women were examined. The incidence of AH at different enterprises was in the average range of 22.7 to 38.9%, and it was directly related not only to sex and age, but occupation. AH (diastolic BP over 95 mm Hg) was found in 6.6% of the individuals in the 17-22 year group, 15.1% among those in the 30-39 year group, 21.9% at 40-44 years, 26.7% at 45-49 years, 34.9% at 50-54 years and 33.3% at 55 years of age and older. These data indicate that AH is encountered the most often after the age of 40. Examination revealed that 35-45% of the patients were not aware of their AH, while those who knew about it did not undergo regular treatment.

AH was extremely rare among women up to 30 years old. In the 35-39 year group, there were 18.2% with AH. This indicator rose with age and constituted 46% at 55 or more years.

To rule out a chance elevation of blood pressure (reaction to the examination, overfatigue, alcohol intake the preceding day) all subjects in whom AH was found at the first screening were asked to return in 4-8 weeks for another examination in greater depth. They submitted to examination of the eye fundus, electrocardiography, urinalysis, anthropometry and, at the same time, they were examined by an experienced cardiologist.

Upon confirmation of AH, the blue- and white-collar workers were referred for dispensary care to physicians of medical sections of plants and city polyclinics. According to the program, the center staff implements constant observation of a so-called active prevention group, which consists of 3635 blue- and white-collar workers. Borderline hypertension (diastolic BP 90-94 mm Hg) was found in 560 of them (15.4%); they are under constant supervision and nondrug steps are taken with them: lectures about limiting table salt in the diet, adverse effect of excessive weight, significance of exercise, proper rest. Speeches by center staff about measures to prevent AH and ischemic heart diseases were organized over radio, television and published in the local press.

Diastolic BP was above 95 mm Hg in 638 people, and all of them were taken for treatment by the staff of the center. This treatment did not involve taking time off work and the plant paid for their medication.

According to preliminary data, a therapeutic response was obtained in a significant part of the patients who took hypotensive agents regularly. BP dropped to normal in 41.7% of the cases and reached a borderline level in 26.7%. Consequently there was a response to therapy in 68.4% of the patients.

Thus, long-term monitored treatment without taking time off work yields a significant therapeutic response. Mass-scale preventive examinations are necessary for prompt elaboration of effective steps to prevent arterial hypertension and ischemic heart disease, and to prevent development of their complications.

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PARTICIPATION OF PUBLIC IN IMPLEMENTING ANNUAL DISPENSARIZATION

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(manuscript received 10 Feb 84) pp 31-34

[Article by P. P. Petrov, A. K. Kul'makhanov and N. V. Vernitskaya, Kazakh Scientific Research Institute of Regional Pathology and Kentau City Medical Association in Chimkent Oblast]

[Text] The June (1983) Plenum of the CPSU Central Committee put to Soviet public health a task of enormous social importance--annual dispensary care of the entire population. It was stressed at the plenum: "Disease prevention and, introduction of annual dispensary care of the entire population as one of the means to this end merit special attention."*

Annual dispensary care of the entire population cannot be discussed without the active participation of the broadest masses. The USSR Ministry of Health (1983) defined the need of active work to explain the goals and objectives of annual dispensary care, as well as of expanding measures pertaining to hygienic education and upbringing of the public, propaganda about disease prevention and guidelines for a healthy life style.

In our opinion, the question of public participation in annual dispensary care ensues from the general approach to the role of the public in health care measures. In the last few years, the forms of their participation in the work of individual institutions and the entire health care system have been rather clearly defined. We refer to public councils at medical institutions, organizations of the Union of Red Cross and Red Crescent Societies of the USSR, sanitary stations operating under their supervision at kolkhozes, sovkhozes, schools and residential buildings. If we analyze thoroughly the content of the work of such organizations, we would find that ultimately they render the most active assistance to health care agencies and therapeutic-preventive institutions.

The All-Union Znaniye Society and its local branches make use of diverse forms of improving the health education of the public--people's universities, schools of health, etc. There, scientists and physicians popularize the latest advances of medical science, tell about the search for means of preventing

*"Materialy Plenuma TsK KPSS 14-15 iyunya 1983" [Proceedings of Plenum of CPSU Central Committee on 14-15 June 1983], Moscow, p 14.

and treating diseases. At the present time, the task has been put of further raising of the scientific level of medical propaganda, making it more understandable and more effective.

The popular movement for sanitary amenities, cleanliness and sanitary education is an effective and fruitful form of action by the public. It has gained wide application in all republics, oblasts, cities and regions of our country.

The struggle for workers' health is growing increasingly important as an element of party, trade union and economic activity. The increasing role of the community in matters related to health care organization reflects a general pattern, increase in the role of the masses in the building of a communist society.

Investigation of this matter revealed the great vital force and practical value of public councils as a form of participation of the people in public health care affairs. At the present time, there are more than 10,000 public councils in our country, which work at health care institutions.

The board of the USSR Ministry of Health (1979) commented on the increased role of public councils at medical institutions of the Ukraine and Kazakhstan in implementing tasks pertaining to safeguarding the health of Soviet people, in particular, preventive check-ups for rural workers and treatment of those found to be sick.

The high rate of results from the work of public councils in the Ukraine and Kazakhstan is attributable to the fact that, in most cases, they are headed by deputy chairmen or officials of executive committees of local councils of people's deputies. The public councils consist of administrators of industrial enterprises, construction projects, kolkhozes, sovkhozes, schools, trade-union and other public organizations. It is not by chance that the public councils work in close contact with local party, soviet, trade-union, Komsomol and other public organizations.

Public councils were very helpful to public health agencies and institutions of Kazakh SSR in preparations for and holding the International WHO Conference on Primary Medical and Sanitary Care, which convened in Alma-Ata in 1978. The experience of Kazakhstan in holding this conference demonstrated convincingly that broad involvement of the community, party, soviet, Komsomol, agricultural agencies and organizations, as well as representatives of industrial enterprises, in solving problems of safeguarding the health of workers is instrumental in refining the organizational forms of work of medical institutions, improving the quality and sophistication of medical care.

The public councils at the municipal hospitals Nos 3, 7 and 14, Mironovskiy and Boguslavskiy central rayon hospitals in Kiev Oblast, Children's Clinical Hospital No 1 and the student polyclinic in Alma-Ata participated actively in preparations for annual dispensary care.

The public councils are becoming more actively involved in organizing mass-scale preventive check-ups and dispensary care.

Much experience has been acquired in Kentau, Chimkent Oblast, Kazakhstan, in involving the public in in-depth medical check-ups of the entire population and dispensary care for them. In Kentau, as in a few other cities of the USSR, comprehensive examinations of the entire population (53,550 people) followed by dispensary observation, have been performed in the nature of a practical clinical experiment, starting in 1977.

Members of health stations in the Red Cross Society have been very helpful to physicians and particularly paramedical personnel in Kentau in the matter of providing dispensary care. For example, at the health center of the Excavator Plant (health center chief--feldsher L. G. Shcherbina), the members of health stations kept things in order during fluorography and primary examinations.

In addition, the activists from the same plant, together with medical workers, explained the purpose of dispensary care at the plant and participated actively in preparing health education bulletins in preparation for annual dispensary care. The group of Red Cross activists, under the supervision of paramedical personnel, conducted a census prior to the start of the mass-scale check-ups.

Members of health stations and activists of the Red Cross at the Excavator Plant check the quality of food daily in the plant dining room and, periodically, inspect the sanitary condition of special gear; they help medical workers of the medical section organize treatment to prevent recurrence of diseases for those who need it.

Experience has shown that the efficacy of dispensary care depends largely on level of the public's knowledge about health matters. For this reason, health education centers on all levels must provide for dissemination among the public of information about the importance of annual dispensary care. Without the broad involvement of the public,and activists among the inhabitants of a city or village, it cannot reach the desired scope.

The experience gained by the Health Education Center in Kentau revealed that there was a high percentage of coverage of the people with physicals at the first stage of dispensary care, since it had been explained to them why annual dispensary screening is performed, what the distinctions are of the work of therapeutic and preventive institutions, what role physicals play in dispensary care, what it means and the importance of early detection of disease to its effective treatment.

The public must be made aware of the fact that the dispensary service is not a one-time measure, it is not a campaign. The residents, particularly those who consider themselves to be virtually healthy, must be convinced of the fact that dispensary care requires good organization, not only of medical workers, but every single person.

The community and activists of the Red Cross Society were very helpful to public health agencies in delivering talks on radio about the meaning of dispensary care, its methods, preparing and disseminating posters and health bulletins, question and answer bulletin boards and in disseminating flyers.

The experience in Kentau shows that one can use movies, exhibits in the foyers of movie theaters on the subject of "Awareness of One's Health," "Your Health is in Your Hands," "Health of the People is the Nation's Asset," etc., in order to propagandize annual dispensary care.

The experiment in Kentau, as in other experimental parts of our country, revealed that it is the most difficult to provide mass-scale in-depth check-ups for the unorganized public--housewives, retired persons, etc. The community must help public health agencies in this respect. There are base points for work with the public in each block of the city, and they were used extensively in preparing for the first stage of dispensary care as the place for meetings with physicians. As a rule, the activists gathered people among residents, including school children and pensioners.

The party's city committee did much for the successful performance of in-depth physicals. By decision of its office, a political day was designated for "Health of the People is the Nation's Asset." Secretaries and members of the party's city committee office, administrators of medical institutions responsible for dispensary care were appointed as speakers. In addition to summary reports, the political classes included exchange of opinions; the significance of in-depth examinations and universal dispensary care was explained to the public. The participants in the political classes expressed their wishes for acceleration and improvement of the first stage of dispensary care.

Classes involving an 8-10-12-h program were organized for activists who were helping medical workers. There were classes on "Dispensary System--the Principal Method of Prevention," "Physical Culture and Sports in People's Life," "Environmental Protection and Public Health," "Harm of Alcohol and Smoking to the Human Body," "Sanitary and Hygienic Education of Adolescents," etc., were held at general education schools, universities and faculties of health.

The number of activists increased as a result of speeches made by medical workers of medical sections and health centers of industrial enterprises and meetings at work reporting on the progress and results of in-depth check-ups and steps to assure uniform coverage of workers with examinations. At the Excavator Plant, progress of the check-ups and dispensary care was taken into consideration in summing up the results of the intershop socialist competition. It happened sometimes that a shop with high marks in achievement in the socialist competition was ranked in lower prize-winning places due to problems in undergoing dispensary examinations. Subsequently, morbidity involving temporary disability at this plant dropped to 11.7 cases and 155.1 days per 100 workers, as compared to the period prior to the start of the dispensary system.

The experiment in Kentau on involving the public to help health care workers in providing dispensary care was entirely justified. As we have already mentioned, the community provided the necessary assistance at the different stages of development of our public health system. But this had been the first time that there was such purposeful involvement of the public in performing an important task put to Soviet public health by the party. In

Kentau, 62% of the inhabitants are members of the Red Cross Society. In 1982, 2100 people were trained in first aid procedures. Each year, up to 500 people are trained to take care of the sick at home. Of the Red Cross activists, 2600 are public health inspectors.

Conclusions

1. Annual dispensarization is an important measure, and the community must be involved extensively in implementing it.

2. Councils at therapeutic and preventive institutions, organizations of the Union of the Red Cross and Red Crescent Societies and health stations at enterprises are good forms of public participation in the work of health care institutions.

3. Coverage of the entire population of Kentau, Kazakh SSR, by the dispensary system, which was done in the nature of an experiment, succeeded thanks to the broad and purposeful cooperation of party, soviet agencies and the community with public health agencies.

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CONTROL OF DRINKING AND ALCOHOLISM AS IMPORTANT MEANS OF DISEASE PREVENTION AND STRENGTHENING HEALTH

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 2, Feb 85 (manuscript received 19 Oct 84) pp 3-8

[Article by N. Ya. Kopyt, Department of Social Hygiene and Public Health Organization (chief--Prof Yu. P. Lisitsyn, corresponding member of the USSR Academy of Medical Sciences), Second Moscow Medical Institute imeni N. I. Pirogov]

[Excerpts] Alcohol abuse is also directly or indirectly one of the most important causes of death. According to WHO data, the mortality indicator among individuals who abuse alcohol is 2-4 times higher than among the general population. From 30 to 50% of all traffic accidents with fatal outcome are related to alcohol intake by drivers. Alcoholic cirrhosis of the liver is one of the 5 leading causes of death in the age groups from 25 to 64 years.

The results of some sampling studies in our country [1-3, 6, 12, 13] warrant the statement that the adverse trends in health status of some population groups observed in recent years (rise in mortality indicators, particularly among men of employable age; significantly higher mortality among men than women at ages 15-49 years; stabilization and, in some parts of the country, decline of average life span among men) are related to some extent to alcohol abuse.

In recent years, in the structure of causes of death there has been an appreciable rise in share of mortality due to accidents, trauma and poisoning, which firmly hold third place, after cardiovascular and oncological disease, whereas in the structure of causes of death among men at the most productive age, they are in second place. According to the data of, for example, M. Ya. Podluzhnaya and S. P. Shilova [13], mortality due to this cause among men of employable age (according to data for West Ural) rose by 60% in the period of 1965-1979. The share of accidents, poisoning and trauma constitutes 50% in the structure of all causes of death among men and 34.8%, among women. A significant part of accidents and trauma (71.2%) occurs primarily away from the job and 74.1% of the victims were inebriated.

Mortality due to trauma and accidents is 3-4 times higher among men than women, and 7-10 times higher among those of employable age. Thus, according

to the data of I. V. Polyakov et al. [12], mortality due to trauma and accidents is 3.4 times higher among men in major cities than women. The share of trauma in different age groups (up to 30 years) constitutes 66.9 to 74.4% of all causes of death. There is a considerable number of deaths due to trauma resulting from traffic accidents, and every 6th-7th victim expired at the site of the accident. Of this number, 85.9% of the victims had been intoxicated, and the vast majority of them (84.9%) were profoundly so. According to the same authors, every 4th victim of an accident, poisoning and trauma died at home, and 85% of them were intoxicated.

According to the results of a study of a sample by L. N. Branskaya et al. [2], mortality among the adult rural population of Kalinin Oblast due to trauma and poisoning constitutes 25% in the structure of all causes of death. The mortality level is 7 times higher among men ($6.1^0/_{00}$) than women ($1.1^0/_{00}$). The highest mortality level among men was referable to the age of 30-39 years ($10.8^0/_{00}$) and among women, 50-59 years ($1.5^0/_{00}$). At the age of 30-49 years, male mortality was more than 10 times higher than among females.

A direct correlation is demonstrable between level of alcohol abuse and mortality due to trauma and accidents in different age and sex groups. According to our data [10], the highest level of male mortality due to accidents, poisoning and trauma in a large city is referable to the most productive working age, 30-49 years. Of all cases of death due to this cause, 53.6% is referable to this age group. At this age one also observes the highest level of alcohol abuse. The share of individuals who abuse alcohol at this age constitutes 60% of all those who abuse alcohol.

Our investigation of the structure of causes of death among men who abuse alcohol,* revealed that the chief cause of death is accidents, poisoning and trauma. They accounted for almost half of all cases of death, and one-third were cases of acute alcohol intoxication. Although cardiovascular diseases constitute a share of about 30% in the structure of causes of death among men, who abuse alcohol, their death due to cardiovascular diseases occurred at a productive age (up to 60 years) in 60% of the cases, whereas among the entire male population death due to these diseases occurs at over 60 years of age in more than 70% of the cases. It should be emphasized in particular that almost 60% of all fatalities among men who abuse alcohol occur at the most productive age (30 to 50 years) (the figure for the entire male population is 53.6%).

Many researchers indicate, with full justification, that alcohol intoxication is a factor instrumental in development of degenerative processes in the myocardium and often provokes a lethal outcome with diseases of the cardiovascular system. Thus, A. M. Vikhert and V. G. Tsyplenkova [5] of the All-Union Cardiological Research Center of the USSR Academy of Medical Sciences maintain, on the basis of special investigations, that "alcohol is a poison

*This group included men on the rolls of drug addiction institutions due to chronic alcoholism, as well as individuals previously taken to a medical sobering station or serviced by an emergency station in a state of alcoholic intoxication.

for the myocardium and long-term alcohol abuse elicits serious cardiac pathology, which often leads to sudden death." According to their data, alcoholic cardiomyopathy is the cause of sudden death in about 25-30% of the cases, mainly among men up to 60 years of age. As noted by the authors, the patients suffering from this pathology seldom and unwillingly admit their alcohol abuse. For this reason, a thorough examination of the history and taking information from relatives and friends play a special role in diagnosing this type of pathology.

It should be noted that the problem of sudden death is one of the important ones in modern medicine due to its increasing incidence in the last 10-15 years, as well as the fact that there is prevalence of men 40-60 years of age among victims of sudden death [4]. On the basis of analysis of a voluminous literature on this subject, Ya. S. Mindlin and I. I. Kosagovskaya [11] observe that the chief cause of sudden death is referable to circulatory diseases (54.4-83%), whereas acute cardiovascular insufficiency is of greatest significance among immediate causes of death (46.4-81.9%). According to the data of Ye. I. Chazov [14], more than 70% of the patients with ischemic heart disease die suddenly, usually away from a medical institution.

According to the results of an investigation conducted by I. M. Virganskaya [3] in the Department of Social Hygiene and Public Health Organization, Second Moscow Medical Institute imeni N. I. Pirogov, cardiovascular disease was the cause of death in 85.4% of the cases of sudden death among men in Moscow at the age of 15-59 years, and of this number more than one-third were intoxicated. Ischemic heart disease accounts for about 70% of all cases of sudden death due to cardiovascular diseases among men at a productive age, and almost 40% of them were inebriated, the blood alcohol concentration corresponding to profound intoxication (more than $2.5^0/_{00}$) in over 40% of the cases. The average age of all male victims of sudden death due to ischemic heart disease in the presence of alcoholic intoxication was 54 years, whereas the average age of men who died of this cause without intoxication was 8 years older (62).

These data concerning the influence of drinking and alcoholism on morbidity and mortality parameters of the population prove convincingly that alcohol abuse is one of the most important health risk factors, and they provide scientific validation for the need to intensify the struggle against this negative manifestation of life style.

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UDC: 616-084.3(47+57)

ORGANIZATION OF MEDICAL BRIGADES FOR DISPENSARIZATION OF PUBLIC

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 2, Feb 85 (manuscript received 16 Apr 84) pp 8-11

[Article by T. A. Kondratenko and V. I. Pakharin, Rostov Oblast Health Department and Rostov Oblast Sanitary and Epidemiological Station]

[Text] There are more than 5480 physicians and paramedical personnel employed in the 62 institutions of the sanitary and epidemiological service of Rostov Oblast. In performing their basic duties to protect the environment, prevent infectious and occupational morbidity, the employees of the sanitary and epidemiological service annually make up to 181,457 tests on various objects, 69% of which involve use of laboratory and instrumentation methods. In recent years, the volume of investigations has increased in the area of monitoring the air environment of industrial premises, levels of noise and vibration, sanitary and bacteriological monitoring of quality of water and foodstuffs.

Analysis of the results of laboratory monitoring of different environmental factors that affect human health makes it possible to elaborate validated health-improving sanitary and hygienic measures. The main directions of work of the service are always related to the basic tasks performed by the public health system.

At the present stage, universal dispensarization of the public is such a task.

The forms of involvement of sanitary and epidemiological stations (SES) in dispensary care of the public have not been defined clearly enough. This oblast has had some experience with regard to SES work on dispensary care of some worker groups.

The integrated work done by SES and therapeutic-preventive institutions (LPU) on dispensary care of workers under industrial conditions that are hazardous with regard to occupational diseases and traumatism served as the basis for these recommendations.

The many years of joint work done by SES, LPU and enterprises made it possible to lower occupational morbidity in Rostov Oblast by 20% and cover about 100% of these groups with medical examinations.

Hygienic training courses using all forms and methods of health education work are offered extensively among workers in order to prevent occupational diseases.

Much attention is given to establishing contact with enterprise administrators. The forms of influence on management of enterprises are not limited to sanctions. All available channels are used: participation in meetings of trade-union committees of enterprises, raising questions of promptness of medical check-ups of workers at meetings of presidiums of sectorial obkoms of trade-unions and groups that effect ongoing checks of fulfillment of integrated plans of health-improvement measures under the city and rayon executive committees.

On Director Days (one of the forms of training enterprise administrators) in large cities of this oblast (Rostov, Taganrog, Volgodonsk), cycles of lectures were delivered on questions of industrial hygiene, organization of medical care for industrial workers, which yielded some positive results. The quality of periodic medical check-ups depends not only on participation of the necessary specialists and performance of laboratory tests, but level of training of shop and district physicians, as well as specialist physicians, in the area of distinctions of working conditions at the enterprises, possible risk factors of occupational, infectious, cardiovascular, oncological and other diseases. For this purpose, a system was adopted for training physicians of therapeutic and preventive institutions in these areas, holding seminars at the oblast SES with polyclinic administrators and shop internists, and involvement of specialists of the Oblast Occupational Disease Center; holding seminars in cities and rayons before starting the check-ups directly at polyclinics and medical sections (MSCh), as well as joint inspection of enterprises by the health inspector [physician] and shop internist the day before the physicals. All this improves the quality of examinations and detection of early signs of occupational diseases.

Expressly these forms of joint work of SES, LPU and industrial enterprises served as the basis for a temporary statute concerning sanitary-medical brigades (LSB) for dispensary care of the entire population, which was developed by the Oblast Health Department, together with organizers of the sanitary and epidemiological service. Such brigades are formed by order of the city health department or central rayon hospital at territorial polyclinics and medical consultation offices, and they do not preclude the work of medical-engineering brigades formed in MSCh of the open and closed types, as well as in shop departments of territorial polyclinics.

The main task for these brigades during the period of providing dispensary care is to coordinate the work of LPU, SES and enterprise management pertaining to organization of examination of workers, investigation of working conditions, domestic services, diet of workers, development and implementation of health-improving measures of medical and sanitary-hygienic plans.

Involvement in dispensary care of the public of physicians specializing in sanitation, who will assume part of the organizational measures to perform preventive check-ups and prevent diseases will make it possible to augment the work load of district internists with regard to medical-diagnostic measures.

The LSB consists of 3-4 uchastok internists (one of whom is designated as the senior), health inspectors [physicians] of any specialty, epidemiologist physicians and their assistants (among the most experienced), feldshers from enterprise health centers who do not have shop service and are in the territory of polyclinics.

The chiefs of polyclinics and internal medicine departments of polyclinics also each head one LSB. The frequency of LSB meetings, procedures for notifying and providing information to one another among members are determined in each specific instance by the senior physician in agreement with the polyclinic chief and chief SES physician, who have the right to check the work of brigade members.

Sanitation specialists included in the brigade establish the list of enterprises in the territory of the polyclinic, define the list of workers, name individuals who come in contact with industrial factors that affect health, define measures to improve industrial conditions. They investigate working and living conditions of individuals under dispensary care, they prepare reports on sanitary and hygienic working conditions referable to the main occupational groups of workers.

Having had experience in working with administrators of industrial enterprises, trade-union committees in monitoring working conditions, the SES specialists are taking on the duty of organizing preventive inspections.

Sanitation specialists offer suggestions, on the basis of analysis of morbidity structure in small industrial enterprises, to management and inform the executive committees of local soviets about this.

On the basis of studying working conditions at enterprises, the health inspectors inform district internists about possible occupational diseases or industrial factors that affect chronic diseases.

SES physicians and their assistants effect special control over progress of examinations of specified groups in the area serviced by polyclinics.

Sanitary specialists who are members of LSB organize training of paramedical personnel of territorial polyclinics, serious attention being given to methods of inspection and observation of sanitary and hygienic conditions of enterprises, public premises, communal and other facilities.

All LSB members are extensively involved in health education work, the main content of which at enterprises and institutions are: dissemination of medical and hygienic information dealing with morbidity, purposeful dissemination of information on control of industrial and household traumatism, as well as in the area of personal and social hygiene.

The work done by the brigades will be examined annually at joint meetings of medical councils of polyclinics or medical institutions and sanitary-epidemiological councils of SES.

Performance of the ordered work will require that health inspectors reserve some special time, and this can be done by adopting measures for scientific organization of labor and involving on a broad scale volunteer health inspectorates and the specialized aktiv of the Red Cross Society in current sanitary surveillance.

At the present time, during this period of preparing for universal coverage with dispensary care, there are already 28 LSB working in cities of this oblast. Such work has also started in rural areas.

A study of the performance of LSB during the period of implementing total coverage with dispensary care will make it possible to assess the effectiveness of adopting this organizational form, test its viability and make appropriate corrections.

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ALCOHOLIC INTOXICATION AND TRAUMATISM AMONG SEAMEN

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 2, Feb 85 (manuscript received 22 Jun 84) pp 22-23

[Article by N. P. Bychikhin, P. I. Sidorov and K. A. Shapovalov, Department of General Surgery (chief--Prof N. P. Bychikhin) and Adolescent Drug Addiction Group (chief--P. I. Sidorov) of Arkhangelsk Medical Institute]

[Text] The rise in indicators of alcohol abuse and its adverse effect on public health, as well as the great economic and moral detriment of heavy drinking, have advanced alcoholism to the ranks of the most important medical and social problems. Traumatism is one of the most widespread consequences of alcohol abuse.

Yu.P. Lisitsyn and N. Ya. Kopyt [1], who analyzed mortality among men who abused alcohol, showed that trauma and poisoning is in first place (47.6%) in the structure of causes of death in this group. The high morbidity level among men who abuse alcohol is also largely attributable to trauma and poisoning. While trauma and poisoning are in fourth place in the morbidity structure of the entire population, they are in second place among men who abuse alcohol. Every third man in this group has one accident per year. According to the data of I. F. Prisakar' [2], alcohol is the cause of serious industrial traumatism in 4.6% of the cases, nonindustrial traumatism in 13.6%, vehicular trauma in 24% and death due to trauma in 46.4%.

Our objective here was to investigate the incidence and severity, as well as nature and distinctions of trauma sustained by seamen who were inebriated and required treatment in a surgical clinic. We analyzed the case histories of naval personnel who were admitted to the North Central Basin Hospital imeni N. A. Semashko in the last 10 years.

It should be noted that 34.9% of all cases of trauma were sustained in an inebriated state. Drunkenness at the time of trauma was observed among both men and women; however, it reliably increased the incidence of traumatism only among men. It has been established that a sharp object is the main source of injury in cases of trauma while inebriated and a dull object, when alcohol was not involved.

The watch-duty type of work done by seamen determines the uniform distribution of alcohol-related and unrelated types of trauma on different days of the week.

We were unable to demonstrate a relationship between accidents among naval personnel and the weekly cycle. It was determined that seamen were hospitalized for trauma in the summertime more often in a sober state, whereas in other seasons there was prevalence of trauma while intoxicated, and it was particularly frequent in the spring.

While trauma in a state of alcoholic intoxication is rare (0.4%) during a voyage and is usually sustained by sober seamen, the picture changes drastically while standing in port, on vacation and shore leave. Thus, seamen sustain 77.0% of the traumas while intoxicated in port. The incidence is also high when they are on leave; 98.9% of the trauma in an inebriated state occur in the ship's home port.

Not only is alcoholic intoxication of seamen often associated with traumatism, it also leads to sustaining more extensive injuries. It was established that single trauma prevails among sober seamen, while multiple ones are found with alcoholic intoxication.

Table 1. Distribution of naval personnel hospitalized with trauma as related to localization and extent of injury (%)

Seaman's conditions	Nature of trauma			
	extent		localization	
	single	multiple	single	multiple
Alcoholic intoxication	67.2	32.8	43.3	56.6
Sober	79.5	20.4	64.0	35.9

Table 2. Structure of traumatism among seamen admitted to hospital as related to presence of alcoholic intoxication (% of total)

Type of trauma	Condition when trauma was sustained	
	Intoxicated	Sober
Contusion	10.4	11.2
Wound	30.5	16.2
Closed cerebrocranial	16.9	11.8
Fracture	34.3	40.5
Traumatic amputation	0.9	2.4
Burn	2.6	4.5
Frostbite	3.1	0.3
Sprain	0.3	1.9
Others	0.7	10.8

In the case of multiple trauma, more serious and combined trauma was usually observed with intoxication (39.7 versus 23.1). One could note the leading role of alcohol intoxication in sustaining serious trauma. The demonstrated pattern is also demonstrable in the distribution of single and multiple localization of trauma. While single localizations were more often found among sober seamen, multiple localizations of trauma were sustained in an intoxicated state (Table 1).

Analysis of time of hospitalization in the surgical department revealed that the injured were admitted in most cases within the first 6 h after trauma was sustained.

It should be noted that some of the injured (3.6%) were hospitalized without medical referral. In such cases, the seamen came to the receiving department on their own on the 1st day after trauma was sustained, when the diagnosis of alcoholic intoxication was obvious or else the victims did not deny it on the 2d and 3d days of forced admission, i.e., in these cases the severity of trauma was obvious to the victim and his active actions were directed toward receiving qualified medical care bypassing the emergency stage in a port city.

Analysis of different types of trauma which were the cause of hospitalization revealed that the largest share was referable to seamen who came to the hospital in an intoxicated state (fractures, wounds, cerebrocranial trauma and contusions; Table 2).

The results of this study indicate that alcoholic intoxication as a factor in situations that are a trauma hazard was found in 34.9% of the injured seamen and it determined the nature and severity of accidents.

It was established that the probability of hospitalization due to trauma in an intoxicated state is particularly high in naval organizations and the trawler fleet. The ship maintenance service is particularly hazardous with respect to "alcoholic traumatism." Hospitalization of ship personnel with closed cerebrocranial trauma, wounds and frostbite is due primarily to alcoholic intoxication.

In conclusion, it should be noted that a well-planned system of organizing propaganda against drinking, early detection and effective treatment of alcoholism among seamen are effective steps toward lowering and preventing occupational and everyday traumatism among naval personnel.

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10,657
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UDC 614.27+615.12]:362.1

ORGANIZATION OF DRUG DISTRIBUTION CENTERS AT THERAPEUTIC AND PREVENTIVE INSTITUTIONS

Moscow FARMATSIYA in Russian Vol 33, No 6, Nov-Dec 84
(manuscript received 27 Jul 83) pp 5-9

OLEYNIK, G. A., PANCHENKO, Ye. I. and BOBROVA, L. M., All-Union Scientific Research Pharmacy Institute, Moscow

[Abstract] An analysis of the pharmaceutical services at various therapeutic institutions has shown that 44.7% lack adequate facilities, and more often than not drugs and other pharmaceutical supplies are dispensed in the corridors or the vestibule of a hospital or clinic. Considerable time is lost in securing supplies from interhospital pharmacies, and the entire distribution system is marked by inefficiency. In those hospitals and clinics with facilities for the hospital pharmacy or dispensing center, the room area ranges from 4 to 90 m^2. An analysis of the problem has resulted in recommendations for adequate room space for the drug-dispensing stations, encompassing a room for unpacking the supplies, storage, a dispensing room, and an information station. The plans encompass recommendations for serving clinics with less than 100 beds, those with 100-300 beds, and hospitals with 300 to 500 beds. The plans are currently under review for implementation in the construction of new hospitals and clinics served by a central interhospital pharmacy. References: 4 Russian. [1852-12172]

HUMAN HEALTH CARE

Vilnius SOVETSKAYA LITVA in Russian 5 Mar 85 p 2

GRISHKYAVICHUS, A., first deputy of LitSSR Minister of Health, candidate of medical sciences

[Abstract] One of the more important stages in preparation towards annual clinical examinations [dispensarization] of the entire population is improvement in the operations of ambulatory-polyclinical centers. Disease prevention is one of the most important routes to improvement of the health status of the population. Introduction of annual population-based screening is a difficult problem tasking organizational and administrative aspects of public health. A number of Lithuanian clinical centers are cited as being ready to participate in this

drive for population screening. The ambulatory-polyclinic service appears to be one of the most important links in the Soviet Public Health System. The burden of this task rests on regional service and there are some problems surfacing at that level: inadequate qualification of the physicians, suboptimal organization of the system. Many of these inadequately prepared physicians should attend postgraduate courses. About 60,000 patients are seen daily in the clinics of the Republic. Each of them should get optimal attention and this leads to commitment of funds. In 1984 about 70% of the population was covered by the public health system; 100% coverage is expected by 1990. Rehabilitation plays an important role in this system. Several academic institutions exist now devoted to this problem. But much more is needed to improve the system: early diagnosis, risk assessment and proper assignment to various treatment regimens.
[299-7813]

WORK ORGANIZATION AND SALARY IN HOSPITALS

Moscow EKONOMICHESKAYA GAZETA in Russian No 10, Mar 85 p 19

[Abstract] An experiment, underway since 1 January 1985 at some hospitals in the Moscow area, aimed at improving the organization of work and provision of economic incentives to workers and ensuring improvement of medical care and improving operation of hospitals by giving hospital directors more latitude in the use of allocated labor, material and financial resources is described and discussed. New rights and responsibilities of directors in assigning staff, determining economic incentives, expending assets and procuring equipment, inventory, medicines etc. are described. Public health agencies, directly subordinate to hospitals carrying out the experiment are responsible for organizing the preparation and execution of the experiment, checking the observance of its conditions and implementing specific measures to increase the responsibility of hospital personnel for the quality of care and treatment.
[292-2791]

ALL-UNION CONFERENCE OF PUBLIC HEALTH SERVICE DIRECTORS

Riga SOVETSKAYA LATVIYA in Russian 5 Mar 85 p 1

[Abstract] Experience in the use of a complex, automated system for universal medical examination of the population (KASMON) [N. B. KASMON = kompleksnaya avtomaticheskaya sistema meditsinskogo osmotra naseleniya] and problems related to its universal introduction were subjects of discussion at the All-Union Conferences of Public Health Workers which opened 4 March in Riga. S. P. Burenkov, USSR Minister of Health, discussed the vast social and economic importance of introduction of annual, general, universal physical examinations. The LatSSR Minister of Health discussed the importance of the use of KASMON in providing physical examinations for all of the population. Latvian specialists demonstrated the possibilities of use of an automated system in detecting diseases and providing effective medical care. Conference participants observed operation of KASMON in various medical facilities in the region.
[293-2791]

UDC 362.172+362.7]:008

METHODS OF IMPROVING MATERNAL AND CHILD HEALTH CARE

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 3, Mar 85
(manuscript received 10 Dec 84) pp 15-18

GREBESHEVA, I. I., chief, Main Administration for Therapeutic and Preventive Maternal and Child Care, USSR Ministry of Health

[Abstract] The decisions of the 26th Party Congress and the subsequent plenums and decrees of the CC CPSU and of the USSR Council of Ministers have placed particular emphasis on the maternal and pediatric aspects of health care in the USSR. With the advent of the annual health exam in the USSR, specific instructions have been developed for the provision of such care to children and pregnant women. However, a review of actual practices has shown the need for a more strict adherence to these recommendations, in that early treatment and monitoring of gravidas with toxicosis and extragenital pathology is quite inadequate in a number of regions. In the urban setting periodic health examinations of the pediatric population have become a way of life, in large measure due to decentralization of the clinics which reduced the number of children per physician to 800. In fact, in many areas this index is even lower. For further improvements in pediatric care it will be necessary to organize teams of medical specialists that will be able to approach any problem based on a preliminary lab workup. Further efficiency of the entire process would be assured by engaging allied health personnel in doing routine physical examinations on a preliminary basis.
[1844-12172]

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ROLE OF CHIEF OF THERAPEUTICS DEPARTMENT AT POLYCLINIC DURING TRANSITION TO PERIODIC HEALTH EXAMINATION PROGRAM

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 3, Mar 85
(manuscript received 28 Mar 84) pp 26-29

L'VOV, A. N., ZHUKOVSKAYA, O. V., SHITOVA, O. V. and PAEGLE, M. S.,
Riga Medical Institute

[Abstract] In light of the implementation of the annual periodic health examination in the USSR as a cornerstone of Soviet medical practice, a questionnaire survey was conducted on the activities and responsibilities of the chiefs of therapeutic departments at 42 polyclinics in Riga. Basically, the duties fall into administrative and clinical categories, the latter including consultative services. However, it also became apparent that in all too many cases routine work and time allocations are poorly planned. The effectiveness of the periodic health examination program rests on close cooperation between the diagnosticians and therapeutists, and, as such, communication between these two specialties must be markedly improved. It is evident that once a week, or

every ten days at a minimum, the chiefs of the therapeutic and diagnostic services should meet to assure a smooth flow of work and monitor the clinical cases. The success of the entire health program depends on the commitment of every physician to its success, and his appreciation of the importance that this has for the Soviet state.
[1844-12172]

UDC 362.1(571.15-22)

MANAGEMENT OF MEDICAL EMERGENCY AND CONSULTATION SERVICES

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 3, Mar 85
(manuscript received 6 Sep 84) pp 46-50

GERASIMENKO, N. F., OSIPOV, Ye. P., YEMESHIN, K. N. and ZEROV, L. M.,
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[Abstract] Description is provided of the management of medical emergency and consultation services designed for rural populations scattered over a wide area. In the Altay Kray the service was designed specifically to reach inaccessible areas and, as a result, has at its disposal specially equipped airplanes and helicopters. The entire system is organized into 5 functional divisions consisting of dispatch unit, radio-consultation unit, a transportation unit, a mobile emergency team, and an administrative unit. The entire service has 10 inter-rayon centers strategically located for maximal effectiveness. The system is radiolinked for optimal utilization of available resources, and supplemented with computer-based data processing systems for record keeping and tracking of personnel, assignments, and diagnostic assistance.
[1844-12172]

UDC 616.8-082.4

ADMINISTRATION OF HOSPITAL-BASED NEUROLOGICAL SERVICES IN URBAN SETTINGS

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 2, Feb 85
(manuscript received 7 May 84) pp 13-15

YEVSEYEV, V. N., Novokuznetsk Institute for the Advanced Training of Physicians

[Abstract] A combination of systems approach and statistical analysis was applied to hospital-based neurological services in Novokuznetsk for the period 1971-1981 to assess the level of performance in terms of population and medical personnel dynamics. On the whole, the trends that were discerned indicated a positive change over the period in question, with the increase in neurologists and neurological hospital beds keeping pace with the population growth. However, a factor of concern was the discrepancy between the increase in hospital bed capacity and the figures for hospitalized patients. For each 1% increase in neurological beds, the increase in hospitalized patients was only 0.88%. It became evident that more efficient monitoring had to be instituted to increase the concordance of activities among the admission, diagnostic and

therapeutic services to insure a proper length of treatment and hospitalization. Implementation of such a monitoring and control system would further optimize neurological patient care in Novokuznetsk.
[1842-12172]

UDC 616-053.2-084.3

SOCIAL AND HYGIENIC FACTORS IN ADMINISTRATION OF GERIATRIC PERIODIC HEALTH EXAMINATIONS

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 2, Feb 85 (manuscript received 28 Jun 84) pp 16-18

PIVOVAROVA, I. P., DZHORBENADZE, D. A., AGADZHANOV, A. S. and GERZMAVA, O. Kh., Republic Scientific Methodological Center of Gerontology and Geriatrics of the Scientific Research Institute of Experimental and Clinical Therapy, Georgian SSR Ministry of Health, Tbilisi

[Abstract] A questionnaire study was conducted on 4072 individuals 50 years old or older to assess the impact and effectiveness of periodic health examinations on their welfare. Analysis of the data provided by the respondents, both employed and retired, showed that the program has serious shortcomings as far as that age group is concerned. Basically, in too many situations, no allowances have been made to provide easier workloads for the employed elderly, and in most cases social and hygienic factors are neglected in assessing their health care and needs. These deficiencies must be corrected in order for the health services to be in compliance with the national health program, since strict emphasis on medical management alone is quite ineffective when social and hygienic factors are neglected.
[1842-12172]

UDC 616-006.04:313.13

METHODOLOGICAL FACTORS IN ASSESSING AND PREDICTING NEOPLASTIC MORBIDITY

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 2, Feb 85 (manuscript received 10 May 84) pp 18-22

RAYKHMAN, Ya. G., Chair of Social Hygiene and Public Health Administration, Rostov Medical Institute

[Abstract] Consideration is given to the methodological approaches used in assessing and predicting neoplastic morbidity, based on variability in environmental risk factors. One approach that is obviously inadequate for the undertaking is reliance on extrapolation alone for a prognosis because of environmental variability. Predictive models have to be based on multifactorial analysis of trends in morbidity in relation to environmental changes. In view of the lack of adequate information about environmental risk factors in the past, recourse has to be had to extensive evaluation of age factors in morbidity and changing morbidity patterns in relation to age. The obvious conclusion is that for a rational assessment of cancer risk, predictions have to be based on logically constructed climato-geographic indicators, rather than on administrative territorial subdivisions.
[1842-12172]

UDC 577.391;615.367;612.015.23

THERMALLY INDUCED RADIORESISTANCE OF ESCHERICHIA COLI CELLS

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 5, Sep-Oct 84
(manuscript received 6 Oct 83) pp 579-583

BRESLER, S. Ye., (deceased), BEKETOVA, A. G., NOSKIN, L. A., ROZENBERG, O. A., STEPANOVA, I. M. and SUSLOV, A. V., Leningrad Institute of Nuclear Physics imeni B. P. Konstantinov, USSR Academy of Sciences, Gatchina

[Abstract] E. coli cells exposed to gamma radiation at 40-45°C show a significant decrease in double strand breaks. This article presents data indicating that this process depends on the state of the cell membrane, which takes part actively in DNA repair. Increasing the temperature of gamma irradiation of cells with the wild repair genotype is accompanied by radioresistance. Heat treatment of E. coli cells results in modification of the incision-excision stage of repair of gamma DNA damage. Induction of the functionally active membrane-associated complex is found to be related to gamma irradiation rather than heat treatment. At the proper temperature the optimal mobility of membranes facilitates immobilization of DNA in the activated repair complex, supporting subsequent balanced repair with minimum yield of lethal double-strand defects. Figures 3; references 20: 9 Russian, 11 Western.
[1613-6508]

UDC 577.391;615.367;612.015.33

GENETIC DETERMINISM AND MECHANISM OF IMPLEMENTATION OF THERMALLY INDUCED RADIORESISTANCE

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 5, Sep-Oct 84
(manuscript received 6 Oct 83) pp 584-589

BRESLER, S. Ye. (deceased), BEKETOVA, A. G., NOSKIN, L. A. and STEPANOVA, I. M., Leningrad Institute of Nuclear Physics imeni B. P. Konstantinov, USSR Academy of Sciences, Gatchina

[Abstract] Primary attention is given to genetic control of the phenomenon of thermally induced radioresistance. The nature of enzyme repair systems, which are primarily responsible for functioning of the thermally dependent repair balance associated with cell membranes, is discussed on the basis of the data obtained. The recA-protein plays a key role in thermally induced

radioresistance. Other, unknown factors may also be important. Thermally induced radioresistance depends completely on the structural integrity of the cell membrane in E. coli. A hypothetical system of functioning of membrane-associated cell repair is presented. The repair balance scheme suggested is based on competition of processes associated and not-associated with membranes. This scheme is indirectly confirmed by a number of facts and explains many effects of chemical and natural radioresistance following exposure to effects inducing rapidly ionizable defects, including gamma irradiation. Figures 4; references 22: 10 Russian, 12 Western.
[1613-6508]

UDC 547.854.4:541.141.7

PRODUCTS OF LASER PHOTOLYSIS OF THYMINE AND THEIR TRANSFORMATIONS UNDER CONDITIONS OF CHEMICAL HYDROLYSIS OF POLYNUCLEOTIDES TO BASES

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 5, Sep-Oct 84
(manuscript received 3 Oct 83) pp 590-594

YAKOVLEV, D. Yu., KOVALSKY, O. I., SIMUKOVA, N. A. and BUDOVSKY, E. I., Institute of Bioorganic Chemistry imeni M. M. Shemyakin, USSR Academy of Sciences, Moscow

[Abstract] The major products of two-quantum photolysis of thymine are identified and a method is suggested for estimation of their quantity in DNA, based on the results of hydrolysis of formic acid. The major products of gamma radiolysis of thymine in liquid aqueous solutions are listed and chromatographs are presented. The same major end products are formed in gamma radiolysis and two-quantum photolysis of thymine, though their relationships are slightly different. Analysis of the distribution of radioactivity on a chromatogram after separation of the products of hydrolysis of the irradiated preparation containing 2-(^{14}C)-thymine allows determination of the number of major products of conversion of thymine to DNA. The quantity of the cyclobutane dimer of thymine and 5-hydroxymethyleneuracyl can be determined directly from the radioactivity of spots 5 and 6 on the chromatogram. The results of analysis of the chromatograms allow correlation of the biological effects of laser radiation with chemical changes of thymine in the polynucleotide chain. Figures 3; references 21: 3 Russian, 18 Western.
[1613-6508]

UDC 577.391;612.014.44;576.8

COMBINED EFFECT OF PHOTOREACTIVATION AND TEMPERATURE ON SURVIVAL OF E. COLI B CELLS IRRADIATED WITH SHORTWAVE UV LIGHT

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 5, Sep-Oct 84
(manuscript received 22 Nov 83) pp 595-598

PETROVA, I. V., MYASNIK, M. N. and SKVORTSOV, V. G., Scientific Research Institute of Medical Radiology, USSR Academy of Medical Sciences, Obninsk

[Abstract] Since temperature reactivation appears only in E. coli B (fil^+) cells, it can be assumed that the method is specific for cells of this strain. Whereas death of UV irradiated E. coli B cells results only from pyrimidine dimers, while visible light and temperatures of 42-45°C can eliminate them from DNA, it would be expected that after full photoreactivation, subsequent cultivation of cells at 42°C should not lead to summation of the effects of visible light and the temperature of 42°C. Conversely, if visible light and a temperature of 42°C modify various types of damages, we should expect summation of these effects. This work presents an experimental check of this hypothysis. Cultivation of cells at 37°C immediately after irradiation results in complete death of type T cells, mixed type PD+T and partially type PD. Cultivation of 42°C causes partial death only of cells type PD and PD+T, while cells of type T are fully restored. After photoreactivation and cultivation at 37°C, cells types T and PD+T die and only cells of type PD are fully restored. Cultivation of cells at 42°C after photoreactivation results in complete restoration of cells type PD, type T and PD+T. It is difficult to state the nature and location of damages modified by the temperature of 42°C. This will require estimation of the temperature modification as a function of UV spectrum. Figures 1; references: 5 Western.
[1613-6508]

UDC 577.391;547.963.3;576.8

MUTAGENIC EFFECT OF GAMMA RAYS ON ESCHERICHIA COLI PLASMID DNA

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 5, Sep-Oct 84
(manuscript received 20 Dec 83) pp 599-602

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[Abstract] Studies of the mutagenic effect of gamma rays on the extracellular phage λ in the dry state have shown that the yield of c mutant is independent of the repair function of the host cells. This indicates that gamma radiation induces premutation damage in the phage. Induction of c-mutations in the λ prophage is also independent of the $recA^+$ cell function. On the other hand, induction of mutation under the influence of ionizing radiation in E. coli cells themselves depends on the products of the genes $recA^+$, $lexA^+$ and $umuC^+$, i.e., requires the participation of the inducible SOS repair system. In order

to establish whether this contradiction is related to specific induction of mutations in phage genes, the authors studied the mutagenic effect of gamma rays in vitro on the bacterial gene galK, included in the composition of the hybrid plasmid pKO482. The study of the mutagenic effect of ionizing radiation on purified DNA also allows estimation as to whether protein and low-molecular-weight components of virions make any contribution to gamma induced mutagenesis in phages. The dependence of the effects of gamma rays upon bacterial cells themselves on $recA^+$ and $lexA^+$ is related to the fact that in the intracellular DNA, ionizing radiation induces a different spectrum of pre-mutation damage than in direct action in vitro on isolated DNA. Figures 3; references 12: 2 Russian, 10 Western.
[1613-6508]

UDC 577.391;612.015.33

GENETIC CONTROL OF PROCESSES OF POSTRADIATION RESTORATION OF COMPACT CHROMOSOME IN MICROCOCCUS RADIODURANS CELLS

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 5, Sep-Oct 84
(manuscript received 19 Oct 83) pp 603-606

KUDRYASHOVA, N. Yu., GROSHEV, V. V. and SHESTAKOV, S. V., Biology Faculty, Moscow State University imeni M. V. Lomonosov

[Abstract] The postradiation restoration of the connection of DNA with membranes during incubation of cells under growth conditions is an important condition for processes of DNA repair and provision of high radioresistance of cells. To study the specifics of repair of the compact membrane-bound chromosome and genetic control of this process in the cells of M. radiodurans, the authors studied the influence of x-radiation and postradiation incubation on the status of the compact chromosome in wild type cells and radiosensitive mutants with defective DNA repair systems. The results produced indicate that the rec-30 gene product is necessary for post radiation repair of compact chromosome damage in the cells of M. radiodurans. This agrees with the suggestion that the products of the rec genes (recA type) play an important role in assuring structural-functional integrity of the compact chromosome in radioresistant bacteria. Figures 2; references 19: 1 Russian, 18 Western.
[1613-6508]

UDC 577.391;539.125.5;611.8

STUDY OF MECHANISMS OF ACTION OF HIGH AND SUPERHIGH DOSES OF GAMMA-QUANTA AND NEUTRONS ON CENTRAL NERVOUS SYSTEM

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 5, Sep-Oct 84
(manuscript received 15 Jul 83) pp 616-619

LAVROVA, G. A., PUSHKAREVA, T. V., NIKANOROVA, N. G. and SVERDLOV, A. G., Leningrad Institute of Nuclear Physics imeni B. P. Konstantinov, USSR Academy of Sciences, Gatchina

[Abstract] In order to understand the paths of development of CNS syndrome and its specifics under neutron bombardment, a study is presented of the condition of brain cells, the permeability of cerebral vessels and several aspects of mediator metabolism. Experiments were performed on 250 male Wistar rats bombarded in a reactor with neutrons with a mean energy of 0.85 MeV, dose at body surface 6.7 Gr/min neutrons, 1.4 Gr/min gamma quanta. ^{60}Co gamma quanta were used to irradiate rats on another device with dose power 90 Gr/min. The doses used were intended to produce the transitional form of radiation sickness with CNS syndrome: neutrons 100-200 Gr, gamma quanta 100-400 Gr. The animals were sacrificed by decapitation four hours or one day after irradiation, the brain fixed in 96% ethyl alcohol, celluloid sections stained and studied. It is found that during the early stages after exposure to very high doses of radiation no increase in permeability of cerebral vessels is noted. Changes in these vessels occurred after two days and indicate a reduction rather than an increase in permeability. Changes in the functional status of the brain and structure of the neurons during development of CNS syndrome are therefore related not to disorders of cerebral vessel permeability, but rather the direct effect of radiation on the cerebral cellular elements. Figure 1; references 14: 10 Russian, 4 Western.
[1613-6508]

UDC 577.391;612.273;599.323.4;636.7

RADIATION DAMAGE TO HEMOPOIESIS UNDER HIGH MOUNTAIN CONDITIONS AS FUNCTION OF ADAPTATION TIME

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 5, Sep-Oct 84
(manuscript received 1 Sep 83) pp 624-629

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[Abstract] There is a significant increase in the resistance of the body to acute hypoxia and the effects of radiation with adaptation to high altitude conditions, probably a result of changes in the hematopoietic system. This article presents a study of radiation damage in the hematopoietic system as a function of time of exposure to high altitude before irradiation. Experiments were performed in a high mountain pass at 3200 m after 3, 15, 22, 25 and 33 days of adaptation on rats and mice. Parallel experiments were performed in

Frunze and Moscow as controls. The animals were irradiated with the minimum lethal dose of 8 Gr at 0.5 Gr/hr. Blood component analysis was performed. The protective effect of preliminary exposure to high altitude factors is found to result from a significant change in metabolic processes at the cell and tissue levels, an increase in DNA synthesis rate in the cells, an increase in erythropoiesis, myelopoiesis and lymphopoiesis, as well as the functional capacity of the coagulating and anticoagulating systems in the process of adaptation to high mountain factors. The activation of hemopoiesis and its higher level functioning at high altitude result from a decrease in periods of circulation of functional cells in the peripheral blood, an increase in the rate of their breakdown and an increase in the production of these cells, indicated by an increase in the relative number of young cells capable of division in the bone marrow and an increase in the mitotic index of these cells. Figures 3; references 11: 10 Russian, 1 Western.
[1613-6508]

UDC 577.391;546.79;616.233

MORPHOLOGIC CHANGES IN INTRAPULMONARY BRONCHI IN RATS IN LONG TERM AFTER INHALATION OF $^{239}PuO_2$

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 5, Sep-Oct 84
(manuscript received 11 Aug 83) pp 636-640

ARISTOV, V. P., KOSHURNIKOVA, N. A. and LEMBERG, B. K., Institute of Biophysics, USSR Ministry of Health, Moscow

[Abstract] A study is made of the dynamics of morphologic changes in the air-carrying paths in the long term (over 180 days) after inhalation of ^{239}Pu. The mean survival time of the rats exposed to $^{239}PuO_2$ was 551.4±31.5 days (absorbed dose on the lungs 11.7 Gr), significantly less than the control (789.0±21.2 days). Typical structural changes of the bronchi were observed in the poisoned rats, corresponding to a picture of catarrhal-fibrous, less frequently purulent, bronchitis. Ultrastructural changes corresponded to a picture of chronic bronchitis and typically showed a combination of destructive changes with compensatory adaptive changes. A major factor in the pathogenesis of chronic bronchitis is disruption of ciliary transport due to a decrease in the number of ciliary cells. Hypertrophy and hyperplasia of secretory cells were also persistently observed. The morphometric data indicate an increase in the mean thickness of bronchial cells by a factor of two in comparison to the control and a compensatory increase in the diameter of the lumen. Chronic inflammation of the bronchial walls was frequently accompanied by squamous-cell metaplasia of the epithelium, focal hyperplasia of basal cells, adenomatous proliferation of the epithelium of terminal segments of the air-carrying tract. These changes indicate stress on regeneration processes in the bronchial epithelium. Figures 2; references 9: 7 Russian, 2 Western.
[1613-6508]

UDC 577.391;547.963.3;612.419;591.434

INTERNUCLEOSOMAL FRAGMENTATION OF NUCLEAR DNA IN CELLS OF SMALL INTESTINAL MUCOSA AND BONE MARROW OF IRRADIATED RATS

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 5, Sep-Oct 84
(manuscript received 2 Sep 83) pp 646-649

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[Abstract] An attempt is made to determine whether decomposition of chromatin occurs in nonlymphoid cells, particularly the small intestinal mucosa and bone marrow, the death of cells of which determines the intestinal and bone-marrow forms of radiation sickness, following irradiation of rats by ^{137}Cs gamma rays at a dose of 10 Gr. Irradiation causes accumulation of products of deep enzymatic degradation of DNA in the thymus, bone marrow and small intestinal mucosa. The data indicate that not only in the lymphoid cells, but also in enterocytes and bone marrow cells, internucleosomal fragmentation of nuclear DNA occurs. With respect to bone marrow, one must consider the presence in this tissue of lymphoid cells. Preliminary calculations show that the quantity of DNA decomposed by the sixth hour exceeds the number of lymphocytes present. It is not probably that the death of the cells is related to initiation of a program of terminal differentiation by the irradiation. The similarity of processes occurring in irradiated cells of various types may indicate occurrence of the same genetic program leading to degradation of DNA and cell death in all of these cell types. Figures 2; references 16: 9 Russian, 7 Western. [1613-6508]

UDC 577.391;612.419;576.35

SURVIVAL RATE OF IRRADIATED ANIMALS AND PRESERVATION OF CFUs AFTER ADMINISTRATION OF CERTAIN RADIOPROTECTORS

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 5, Sep-Oct 84
(manuscript received 8 Dec 82) pp 651-654

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[Abstract] The tasks of this study were: 1) to compare radiation damage of the entire body and hematopoietic system with various doses of radiation and various radioprotectors; and 2) to compare the quantitative criteria of modification of the survival rate of the irradiated body and the colony-forming capability of bone marrow cells with various radioprotectors. The work was performed on 410 male mice irradiated at a broad range of doses by 4 cesium sources. Thirty day survival of the animals was studied after irradiation at 8.1 Gr. The number of caryocytes in the bone marrow of the femur and endogenous spleen colonies on the ninth day after irradiation at 4.5-8.1 Gr were determined. The radioprotectors included 2,2,5-trimethylthiazolidine hydrochloride (I), the ethyl ester of 2,2-dimethylthiazolidine-4-carboxylic acid HCl (II),

l-cysteine (III), colchisine (IV), a salt of 5-phenyl-tetrazole with dipiperidyl propane 1,3 (V), mercamine and the dipotassium salt of 2,4-di(α-methoxyethyl deuteroporphyrin, administered intraperitoneally, usually fifteen minutes before irradiation. The data obtained indicate that effective radioprotectors, regardless of their action mechanism, facilitate preservation of the hematopoietic function of the irradiated organism, which can be adequately evaluated by the radiosensitive indicator--the ability of hematopoietic cells to form endogenous colonies in the spleen. References 12: 10 Russian, 2 Western. [1613-6508]

UDC 577.391;66312/.14.661.719

ROLE OF GLUTATHIONE IN NATURAL AND MODIFIED RADIORESISTANCE OF YEAST CELLS

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 5, Sep-Oct 84
(manuscript received 20 Jan 84) pp 654-656

ZOLOTAREVA, L. T., GRAYEVSKAYA, Ye. E. and GONCHARENKO, Ye. N., Chemistry and Biology Faculties, Moscow State University imeni M. V. Lomonosov

[Abstract] The method of direct determination of glutathione with variable natural and modified radioresistance was used in studies of aploid and diploid strains of wild type Saccharomyces cerevisiae and Pichia guilliermondii, which have different levels of radiosensitivity. The radioprotector used was 2-amino-2-thiazoline (2-AT). The data confirm the existence of a direct dependence between the sensitivity of the cells to irradiation, which can be modified by a protector, and the accumulation of biologically active substances participating in the formation of increased radioresistance in the organism. References 14: 6 Russian, 8 Western.
[1613-6508]

UDC 577.391;661.719;612.014.43

INFLUENCE OF CYSTAMINE ON SURVIVAL RATE OF MICE AND ENDOGENOUS COLONY FORMATION WITH COMBINED RADIATION AND HEAT DAMAGE

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 5, Sep-Oct 84
(manuscript received 5 Dec 83) pp 657-659

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[Abstract] An estimate is presented of the effectiveness of preventive application of cystamine before exposure to radiation and thermal trauma. Experiments were performed on 240 mice irradiated with 7 Gr gamma rays. Deep burn over 10% of the surface area of the body was applied by light flash from quartz-halogen lamps 48 hours after irradiation. Cystamine dihydrochloride was administered intraperitoneally at 150 mg/kg 15 to 20 minutes before irradiation. Administration of cystamine was found to protect the animals from death due to combined

radiation and heat trauma regardless of the time of application of the burn trauma. The use of cystamine had a positive influence on the intensity of endogenous colony formation in all groups as well. References 8: 5 Russian, 3 Western.
[1613-6508]

UDC 577.391;546.79;591.111

BEHAVIOR OF Pu(IV) IN BLOOD SERUM

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 5, Sep-Oct 84
(manuscript received 20 Oct 83) pp 666-668

SUROVA, Z. I., Institute of Biophysics, USSR Ministry of Health, Moscow

[Abstract] A study is presented of the extent to which various compounds of plutonium manifest a capability for hydrolysis and polymerization under conditions similar to those observed in blood serum. A nitric acid solution of polymer Pu(IV) with pH 1.0, nitric acid solution of Pu(IV) in 1 M HNO_3, nitric acid solution of Pu(IV) with pH 1.5, Pu(IV) in 0.077 and 0.23 M solutions of sodium citrate with pH 7.4 were used in the study. It was found that polymer Pu(IV) was practically completely bonded with high molecular weight proteins and not sorbed on sephadex, indicating the great bond strength of polymer Pu(IV) with high molecular weight proteins. Upon incubation of citrate complexes with blood serum the fraction of Pu(IV) which made the transition to the coarsely-dispersed hydroxide particles was not over 3.8%, 3% bonding with high molecular weight proteins. Increasing the citrate ion concentration from 0.07 to 0.23 M did not decrease the fraction of hydrolyzed forms of Pu(IV) in the serum, though in experiments with citrate solutions it was an order of magnitude less than in experiments with nitrate solutions. References 10: 9 Russian, 1 Western.
[1613-6508]

UDC 577.391;546.79

LONG TERM AFTER SEQUELAE OF COMBINED ACTION OF EXTERNAL ^{137}CSS GAMMA-RADIATION AND INCORPORATED ^{239}Pu

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 5, Sep-Oct 84
(manuscript received 30 Sep 83) pp 668-671

BULDAKOV, L. A. and LEVDIK, T. I., Institute of Biophysics, USSR Ministry of Health, Moscow

[Abstract] A study was made of the survival and tumor effects after combined one-time external gamma irradiation and administration of ^{239}Pu in doses near the optimal blastomogenic doses. The experiments were performed on 700 Wistar rats, with 100 males and 100 females as controls, 50 each males and females in five groups receiving gamma radiation at 51.6 and 103.2 mCl/kg, intravenous

^{239}Pu nitrate solution (pH 1.5), and a combination of both factors at the two doses, plutonium administered six days after irradiation. Mean survival time decreased in all experimental groups and malignant tumors developed more quickly than in the control. Only the first series showed no increase in malignant tumors. Plutonium caused malignant tumors more frequently than gamma radiation alone. When both factors were administered the effect was near additive in terms of absorbed dose. References 2: 1 Russian, 1 Western.
[1613-6508]

UDC 577.391;546.79;616.006

CARCINOGENIC EFFECT OF COMBINED EXPOSURE TO ^{241}Am AND GAMMA RADIATION

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 5, Sep-Oct 84
(manuscript received 23 May 83) pp 675-678

FILIPPOVA, L. G., BULDAKOV, L. A. and NIFATOV, A. P., Institute of Biophysics, USSR Ministry of Health, Moscow

[Abstract] Experiments were performed on 1,317 Wistar rats of both sexes. Eighty-five were a control, eighty-one were exposed to gamma radiation from ^{137}Cs at 0.0399 mA/kg, mean absorbed dose 175 cGr. 574 rats received ^{241}Am nitrate intraperitoneally at 6.7-229.4 kBq/kg body mass. The remaining 567 rats received the same quantity of americium then after seven days were irradiated on the gamma installation creating an absorbed dose of 175 cGr. Materials obtained from dissection of the animals after they died were processed by the usual histological methods. All combinations and individuals effects used decreased survival time. The combined effect of americium and gamma radiation resulted in summation of the carcinogenic effect. The greatest danger was that of skeletal tumors, which appeared after high absorbed doses. The number of osteosarcomas per one cGr absorbed dose after combined and isolated effects was the same. References: 2 Russian.
[1613-6508]

UDC 577.391;546.79

MECHANISM OF DISTRIBUTION OF NEPTUNIUM AND PLUTONIUM IN RAT BODY

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 5, Sep-Oct 84
(manuscript received 11 Aug 83) pp 679-682

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[Abstract] Experiments were performed on female white rats. After incubation of the blood serum of intact animals with a solution of polymer Np(IV) in vitro, the fraction of the metal bonded to high molecular weight proteins was separated. A similar procedure was performed with Pu(IV) citrate which bonded with low molecular weight proteins. Aliquots of the isolated fractions were administered into the caudal vein of the rats, which were decapitated over a period of time,

three to four animals per time interval. The administered dose of ratioactive elements was 580, 790 and 230 Bq for the high molecular, low molecular mass and nonprotein fractions, respectively. The blood, liver, femur, spleen, kidneys and one day of excrement were taken from the animals sacrificed for radiometry. Primary attention was concentrated on the physical and chemical form of the metal in each case. Radiometry showed that the fractions of metal studied acted differently in the organism. Four minutes after administration, some 8.8% of the administered dose of the radioactive element was found in the blood in the case of the high molecular weight fraction, 64% for the low molecular weight fraction and 29% for the nonprotein fraction. Rapid excretion of the nonprotein fraction from the blood occurred due to its migration in the intercellular fluid. The results of the studies allowed several suggestions as to the mechanism of deposition of the radioactive elements, particularly Pu, in the major pooling organs. The nonprotein fraction of the elements is probably capable of penetrating rapidly from the blood into all tissues, but is primarily retained by the skeleton. The liver captures the hydrolyzed forms of the metals firmly bonded to the high molecular weight proteins. A certain quantity of metal bonded to the low molecular weight proteins also enters the liver. The low molecular weight proteins may simply temporarily retain the radioactive elements in the blood, the relative lability of the bond between metals and these proteins supporting gradual transition to the nonprotein complex and final retention by the skeleton. References 11: 6 Russian, 5 Western. [1613-6508]

UDC 577.391:591.111;576.809.7

COMPARATIVE ANTIRADIATION EFFECTNESS OF NATIVE AND IN VITRO IRRADIATED HORSE SERUM IMMUNOGLOBULINS

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 5, Sep-Oct 84
(manuscript received 20 Dec 83) pp 682-686

SHALNOVA, G. A., KLEMPARSKAYA, N. N., DOBRONRAVOVA, N. N., KUZ'MINA, T. D., ULANOVA, A. M., PINEGIN, B. V., KORSHUNOV, V. M., YERMOLOV, V. V., GLAD'KO, I. A. and NEVINNAYA, A. P., Institute of Biophysics, USSR Ministry of Health, Moscow

[Abstract] A study was made of the therapeutic effect of horse serum immunoglobulin, native and irradiated, after base immunization and 1 to 24 cycles of immunization in order to produce immune antitetanus serum. The influence of parenteral administration of these preparations on the quantitative and qualitative composition of small intestinal microflora of irradiated mice was also studied. The optimal treatment scheme for irradiated mice with both native and irradiated horse immunoglobulin consisted of triple administration 2, 24 and 48 hours before irradiation. In this case at all doses of the preparations tested the survival rates of the mice significantly improved. The data indicate that irradiation of horse serum immunoglobulin in vitro in sterilizing doses does not decrease its antiradiation activity for treatment of animals irradiated with LD_{75-95}, and in fact increases its effectiveness in many cases. Both native and irradiated horse serum preparations were found to have antiradiation effects, proven by increased survival time, reduction in development of dysbacteriosis of the small intestine and endogenous infection. References: 10 Russian. [1613-6508]

UDC 577.391;612.01.017.1;612.119

EFFECT OF DIUCYPHONE ON HEMATOPOIETIC SYSTEM AND IMMUNITY IN NORMAL AND IRRADIATED ORGANISM

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 5, Sep-Oct 84
(manuscript received 20 Oct 83) pp 687-689

KOSTYUK, L. Ye., SEMINA, O. V., KURILETS, E. S., POVERENNY, A. M., GOLOSHCHAPOV, N. M. and SEMINETS, T. N., Scientific Research Institute of Medical Radiology, USSR Academy of Medical Sciences, Obninsk

[Abstract] A study was made of the effect of diucyphone which has properties of a nonspecific immune response stimulator on hematopoietic stem cells in the normal and irradiated organism. Hybrid male mice 2.5 months in age were studied. Diucyphone was administered to donors three times intraperitoneally at 50 mg/kg, 2, 3 and 4 days before bone marrow was removed. In some series of experiments ten days before bone marrow was removed the donors were irradiated with ^{60}Co gamma rays at a dose of 4 Gr at 0.55 Gr/min. Recipients were irradiated under the same conditions at 8.5 Gr. Bone marrow cells were administered to lethally irradiated recipients, 0.5 MLi/v. Some recipients received intact thymus cells, $2 \cdot 10^7$ cells per mouse i/v 30-40 minutes before injection of bone marrow cells. In separate experiments animals 6, 7 and 8 days after irradiation at 4 Gr received injections of diucyphone intraperitoneally at 50 mg/kg and on the tenth day were immunized with sheep erythrocytes, $5 \cdot 10^8$ cells per mouse. Administration of diucyphone at the beginning of the period of recovery of immune response after irradiation helps to increase the immune response. The effect of diucyphone is to accelerate recovery of the population of T lymphocytes taking part in antibody formation, manifested as an increase in immune response. Unexpected results were obtained in the study of the effect of diucyphone on colony formation in nonirradiated donors. It was found that three times administration of the preparation 2, 3 and 4 days before taking of bone marrow decreases the colony formation activity by a factor of 1.5-2. Administration of thymus cells completely normalizes CFUs in the bone marrow. This indicates that the effect of the preparation is directed towards cells required in normal growth of spleen colonies.
References 9: 5 Russian, 4 Western.
[1613-6508]

UDC 577.391;663.12/14

MATHEMATICAL DESCRIPTION OF RECOVERY OF YEAST CELLS AFTER COMBINED EFFECT OF IONIZING RADIATION AND HYPERTHERMIA

Moscow RADIOBIOLOGIYA in Russian Vol 24, No 5, Sep-Oct 84
(manuscript received 30 Aug 83) pp 700-703

KOMAROV, V. P. and PETIN, V. G., Biophysics Laboratory, Scientific Research Institute of Medical Radiology, USSR Academy of Medical Sciences, Obninsk

[Abstract] A mathematical model is suggested to describe the capability of cells for recovery following exposure to synergistic factors. The model is based on the assumption that the synergic effect results from the formation of additional lethal damage due to interaction of 'subdamages' caused by the individual agents. According to this model, with simultaneous, combined action of ionizing radiation and hyperthermia, cells contain lethal damage sites caused by ionizing radiation, lethal damage sites caused by hyperthermia, and lethal damage sites caused by the interaction of two 'subdamages' induced by the two factors. The results produced indicate that lethal damage caused by the interaction of 'subdamages' from the two factors should not be subject to easy recovery. Correspondingly, the death of cells following such action should be accompanied by more 'severe' forms of inactivation than the death of cells after exposure to ionizing radiation or hyperthermia alone. An earlier work determined that the death of cells after the combined exposure usually occurred without preliminary division, whereas after exposure to one factor or the other alone death occurred after a certain number (at least one) of postradiation divisions. References 8: 4 Russian, 4 Western.
[1613-6508]

UDC 547.02.:612.014.482

ACTIVITY OF GUANOSINE DIPHOSPHATASE AND GUANOSINE TRIPHOSPHATASE IN RAT'S BRAIN AND IN LIVER DUE TO RADIATION DAMAGE

Kiev UKRAINSKIY BIOKHIMICHESKIY ZHURNAL in Russian Vol 57, No 2, Mar-Apr 85
(manuscript received 19 Jul 84) pp 73-76

SAVITSKIY, I. V., Odessa Medical Institute imeni N. I. Pirogov

[Abstract] The goal of this study was to determine the activity of guanosine triphosphatase (GTP-ase) and guanosine diphosphatase (GDP-ase) in brain and in liver tissues of irradiated animals, because one of the leading mechanisms of metabolic disturbances in radiation sickness is altered metabolism of nucleotides and nucleic acids. White male Wistar rats were irradiated with [^{60}Co] gamma-quanta in a dose of 774 mC/kg; enzymatic activity was then determined at 1, 3, 6, 24 and 48 hrs post exposure. It was shown that the activity of GTP-ase was depressed more markedly than that of the GDP-ase; strongest depression was in brain mitochondria at 1 and 3 hours post irradiation. The changes in enzymic activity in liver mitochondria were quite complex. These changes could serve as biological indicators of the extent of the radiation damage. References 13: 11 Russian (1 by Western author), 2 Western.
[1830-7813]

VETERINARY MEDICINE

ELIXIR FOR ANIMALS

Moscow TEKHNIKA I NAUKA in Russian No 2, Feb 85 p 21

[Article by F. Sveshnikov, special correspondent to "Tekhnika i nauka"]

[Text] In 1984 a large group of scientists and industrial and agricultural workers were awarded the USSR Council of Ministers prize for the development, introduction and use of a feed preparation, microbiological carotene (KPMK), in live-stock farming.

Our special correspondent, F. Sveshnikov, discusses the role of KPMK in resolution of the Food Program and the way its production might be significantly increased.

Why, in some cases, is fresh beef juicy-red in color and in others bluish-violet? Why does milk sometimes have the warm color of cream and sometimes the bluish color of skimmed milk? And why are some egg yolks really yellow and others whitish? The answer to these questions is the same--it all depends on how saturated the products are with carotene.

In order for the foods which reach our tables to be in top condition, animal feed must contain two important components--vitamin A and beta-carotene. Neither of these is synthesized in the animal body.

Pure carotene, which is present in plant feed, is very unstable and easily breaks down during long-term storage. Consequently, in midwinter the amount of carotene in prepared feed sharply decreases, which inevitably causes a metabolic disorder in animals, vitamin deficiency. As a result, their productivity and fertility decreases.

It is therefore not by chance that the problem of creating and assimilating industrial production of artificial preparations which are rich in vitamin A has been worked on for many years.

Scientists from the Institute of Microbiology of the USSR Academy of Sciences, the Institute of Biochemistry and Physiology of Microorganisms of the USSR Academy of Sciences and the All-Union Scientific Research Institute of Vitamins under the management of academicians, G. K. Skryabin and A. A. Imshenetskiy, have solved this problem. They identified a productive strain of microscopic fungus which is rich in carotene. They discovered ways to reproduce it quickly and methods for obtaining nutritive and feed preparations of microbiological beta-carotene (KPMK).

The biomass of the fungus contains some 20 biologically active substances, amino acids, vitamin B group complexes, lipids and proteins. Therefore, the calorific value of KPMK is three times greater than the calorific value of high-grade alfalfa flour.

One of the discoverers of KPMK, Doctor of Biological Sciences, M. N. Bekhterev, has the following to say:

Beta-carotene together with other additives permits the intensification of the biopotential of animals and the stimulation of such precise biochemical processes in their bodies as productivity and fertility. The vitaminization of feed significantly facilitates the industrialization of live-stock farming.

The value of microbiological carotene is that it is stable, nontoxic and its production is not tied to seasonal fluctuation. . .

The Krasnodar Biochemical and Vitamin Preparation Combine was the first in the country to produce KPMK. It was followed by the Verkhnednepr Starch Syrup Combine and several enterprises of the USSR Ministry of the Medical Industry and the Uzbek SSR Ministry of the Food Industry. The amount of carotene they produce annually is equivalent to that contained in several million tons of raw alfalfa or several hundred thousand tons of carrots.

Testing of the effectiveness of the new preparation on a large stock of cattle on large state farms and collective farms of the Ukraine and Sverdlovsk Oblast yielded excellent results. There it was confirmed that animal weight gain increased by 15% and that of chicks up to 34%. Simultaneously, an increase in offspring, a higher survival rate of young stock and an increase in the egg yield of hens was noted.

On the whole, as it turned out, one ruble invested in the production of carotene is worth 4-5 rubles in profit.

Nevertheless, livestock farming is today in great need of this preparation. Even the new plant whose construction is planned for the 12th 5-Year Plan will not help the situation. What is the solution to this problem? Specialists from the Scientific Industrial Association "Vitamina" of the USSR Ministry of the Medical Industry believe that it is possible to significantly increase the production of KPMK if small shops are built at enterprises which have at their disposal nonnutritive, economical and available sources of raw materials. This, it appears, is a practicable way to solve the problem . . .

12793
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PREPARATIVE METHOD OF ISOLATING INFLUENZA VIRUS GLYCOPROTEINS

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 11, No 2, Feb 85
(manuscript received 6 Jul 84; final draft received 6 Jul 84) pp 248-253

MEDVEDEV, S. A., ARBATSKIY, N. P., LIKHOSHERSTOV, L. M., YURTOV, D. V., DEREVITSKAYA, V. A. and KICHETKOV, N. K., Institute of Organic Chemistry imeni N. D. Zelinskiy, USSR Academy of Sciences, Moscow

[Abstract] Development of a convenient preparative method of producing biologically active glycoproteins of A/Texas/77 and A/Leningrad/80 influenza virus with use of Triton N-101 and cetylpyridinium chloride (SRS) was described and discussed. The glycoproteins were solubilized by adding detergent to the various suspensions, mixing the reaction mixture and separating the crustal part of the virus particles by centrifugation, with subsequent analysis of the solution and precipitate. Two methods (one using hemagglutinin and one using neuraminidase) for producing glycoproteins with the aid of Triton N-101 and SRS were developed. Optimum conditions for solubilization of glycoprotein with yields of 70-80 percent include processing influenza virus (1 mg/ml of protein) by detergents (with weight relationship of Triton:protein 20:1 or SRS:protein 1:1) for 1 hour at 20°C. Figure 1; references 12: 4 Russian, 8 Western. [1841-2791]

SIXTH CONGRESS OF UKRAINIAN MICROBIOLOGICAL SOCIETY

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 46, No 6, Nov-Dec 84 pp 98-102

[Article by S. V. Afonskaya]

[Excerpts] The 6th Congress of the Ukrainian Microbiological Society (UMO) under the UkSSR Academy of Sciences, which is a department of the All-Union Microbiological Society, convened in Donetsk from 14 to 16 July 1984. More than 250 people participated in its work--microbiologists and virologists, workers from 46 scientific, educational institutions and enterprises in 19 cities of the Ukraine, as well as representatives of Union republics.

Much interest was displayed in the papers of B. P. Matselyukh, doctor of biological sciences (Institute of Microbiology and Virology--IMV--Ukrainian Academy of Sciences, Kiev), "Use of Gene and Cell Engineering in Development of Actinomycetes Strains With New Properties," and Prof G. M. Shavlovskiy (Lvov Department of the Institute of Biochemistry, Ukrainian Academy of Sciences), "Cellular Systems of Coordinating Metabolism in Microorganisms." The paper delivered by P. I. Gvozdyak (Institute of Colloid Chemistry and Chemistry of Water--IKKhKhV -- Ukrainian Academy of Sciences, Kiev), "Theory and Practice of Microbiological Purification of Water," advanced new approaches to treatment of liquid industrial waste by the microbiological method.

Subsequent work of the congress proceeded in nine sections: 1) general microbiology and genetics; 2) physiology and biochemistry of microorganisms; 3) geochemical activity of microorganisms and biocorrosion; 4) microbiology of water treatment; 5) industrial microbiology; 6) soil microbiology; 7) entomopathogenic and phytopathogenic microorganisms; 8) virology; 9) medical and veterinary microbiology. Antibiotics.

Some interest was shown in papers dealing with genetics of microorganisms: investigation of fertility plasmids (Ye. M. Savinova, Institute for Advanced Training of Physicians, Kharkov), drug resistance of Shigella (V. A. Shatilo, A. M. Zaritskiy, Kiev Scientific Research Institute of Epidemiology and Infectious Diseases), role of plasmids in processes of bacterial destruction of anion Surfactants (L. V. Ovcharov, T. G. Yakovenko, IKKhKhV, Ukrainian Academy of Sciences), genetic recombinations upon fusion of Streptomycetes protoplasts (A. A. Shevchenko, M. Ye. Podgorskaya, IMV, Ukrainian Academy of Sciences), antibiotic-producing character in Actinomycetes (A. M. Strizhkova, Ye. P. Dovbysh, IMV, Ukrainian Academy of Sciences, Kiev).

The paper of A. M. Zaychenko (IMV, Ukrainian Academy of Sciences, Kiev) dealt with the effect of toxins of the trichothecin class on synthesis of protein and nucleic acids in model systems of Saccharomyces vini and discussed the possible mechanisms of inhibitory action of mycotoxins.

The problem of biocorrosion of cement in treatment plants was raised for the first time in our country; it is being solved by builders and microbiologists of this republic (G. Ya. Drozd et al., Makeyevka Building Engineering Institute; IMV, Ukrainian Academy of Sciences, Kiev).

In the section, "Entomopathogenic and Phytopathogenic Microorganisms," much interest was shown in the paper delivered by Prof R. I. Gvozdyak (IMV, Ukrainian Academy of Sciences, Kiev) concerning the prospects of using phytopathogenic bacteria in the national economy. Particular interest was inspired in participants at the conference by papers about the phytopathogenic properties of bacteria isolated from urological patients (S. F. Khodos and V. L. Chaykovskaya, IMV, Ukrainian Academy of Sciences, Kiev) and induced hypersensitivity reaction of tobacco leaves under the effect of bacteria of the genus Klebsiella (A. I. Turyanitsa and A. M. Sadlyak, Uzhgorod State University). Use of bacteria to control malaria mosquito larvae was the topic of the paper of A. A. Stus' and L. N. Kuznetsov (Crimean Experimental Horticulture Station, Department of Soil Microbiology of Southwestern USSR, All-Union Scientific Research Institute of Agricultural Microbiology, Simferopol). I. A. Kirichenko and A. I. Rykhletskaya submitted interesting data about a study and use of antibacterial agents for industrial feeding of the Chinese silkworm (Ukrainian Ukrplemgrena Scientific Production Assocation, Merefa).

The papers delivered in the "Virology" section at a meeting dealing with "Viruses of Microorganisms, Plants and Insects" by Prof Ya. G. Kishko (IMV, Ukrainian Academy of Sciences), "Temperate Viruses: Problems of Theory and Practice," and V. A. Vasil'yeva et al., "Results and Objectives of Investigation of Safety of Viral Insecticides" (Kiev Scientific Research Institute of Epidemiology and Infectious Diseases) prompted an animated discussion.

The main results of studying arboviruses in Ukrainian SSR were submitted in the paper by I. A. Vinograd and S. S. Chumachenko (Institute of Epidemiology and Microbiology, Lvov). N. S. Dyachenko, doctor of biological sciences, et al. (IMV, Ukrainian Academy of Sciences) discussed the possibility of validating some theses of immune biotechnology on the model of adenoviral hexone.

Much interest was displayed in the paper delivered by V. V. Smirnov, corresponding member of the Ukrainian Academy of Sciences, et al., "Antibiotics--Bacteriocins of Bacteria of the Genus Pseudomonas" (IMV, Ukrainian Academy of Sciences).

Prof V. K. Patratiy et al. (Chernovtsy Medical Institute) reported on antiviral and antibacterial activity of new quaternary phosphonium and ammonium compounds. The paper of S. I. Sytnik (Ternopol Medical Institute) dealt with mucosal microflora and its sensitivity to antibiotics in cases of postresection gastritis and anastamositis.

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CSO: 1840/1829

2ND ALL-UNION CONFERENCE ON 'RESULTS AND PERSPECTIVES OF RESEARCH ON MICROBIAL POLYSACCHARIDES'

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 46, No 6, Nov-Dec 84 pp 97-98

VARBANETS, L. D.

[Abstract] The 2nd All-Union Conference on Results and Perspectives of Research on Microbial Polysaccharides was held on July 2-3, 1984 in Leningrad, organized jointly by the Leningrad Institute of Pharmaceutical Chemistry and the USSR Ministry of Medical Industry. The conference consisted of 14 plenary and 37 sectional reports, as well as of over 100 poster sessions. The conference was opened by Professor N. P. Yelinov (Leningrad), who summarized the importance of basic and applied research on the polysaccharides. In other reports N. Yu. Alekseyeva et al. (Moscow) reported on the immunogenicity of microbial polysaccharide-synthetic polyelectrolyte conjugates, particularly on the effectiveness of salmonella O-antigens enhanced in this manner. A number of poster sessions dealt with the synthesis of dextran-70 by Leuconostoc mesenteroides (V. P. Khomov, Leningrad), that has found use as blood substitutes (V. M. Vagabov, Pushchino). Other poster sessions dealt with the synthesis of salmonellar O-polysaccharide (V. N. Shibayev, Moscow). Ye. P. Feofilova (Moscow) reported on the use of chitin in biotechnology as adsorbents in affinity, ion exchange, chelate and gel chromatography for the preparation of highly purified enzymes (lysozyme, trypsin), lectins, and hemagglutinins. R. P. Gorshkova (Vladivostok) reported on her studies on Yersinia enterocolitica lipopolysaccharides, with the carbohydrate moieties represented by beta-1,2- and 1,3-linked linear 6-deoxy-L-rhamnanes. In addition, her group also succeeded in isolating inactive 1,3-linked rhamnanes. The immunodominant role in these polysaccharides is displayed by acid-labile D-xylulose, which is rarely encountered in nature. The conference concluded with a unanimous resolution to hold the 3rd All-Union Conference on this topic in Kiev, at the Institute of Microbiology and Virology of the Ukrainian SSR Academy of Sciences. [1826-12172]

UDC 614.1:392.3]:061.3(470)"1984"

SCIENTIFIC AND PRACTICAL CONFERENCE ON STRENGTHENING FAMILY UNIT AND PUBLIC HEALTH PROTECTION

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 2, Feb 85
pp 42-44

PONEDEL'NIK, S. V., Rostov-on-Don

[Abstract] A scientific and practical conference on the title topic was held in June, 1984 in Rostov-on-Don entitled "Strengthening the Family Unit and Public Health Within the Scope of Demographic Politics". The conference was organized by the local medical and governmental authorities, and the RSFSR Ministry of Health. The participants consisted of more than 400 scientists, physicians, public health administrators, party and government representatives, psychologists, and other specialists. The various social, education, moral, and hygienic factors pertinent to the topics of the conference were covered in 27 reports. For example, A. G. Volkov (USSR Central Statistical Administration) dealt with family development in the USSR. Based on the last two censuses, it appears that the current trend is toward a smaller family size, and that the mean age of those entering upon a married life has decreased. In addition, a recent positive trend is a decrease in the number of divorces. Nevertheless, the incidence of divorce after 3-5 years of marriage remains high and is indicative to the instability of young families. Although the highest birthrate since WWII was noted in 1983, the need for a further increase in the Soviet birthrate still remains a topic of discussion. The conference ended with recommendations for further improvements in the demographic situation in the USSR.
[1842-12172]

MISCELLANEOUS

A. M. RABINOVICH INTERVIEWED ABOUT CONFERENCE ON TROPICAL MEDICINE IN HO CHI MINH CITY

Moscow SEL'SKAYA ZHIZN' in Russian 31 Mar 85 p 3

[Interview with Aleksandr Moiseyevich Rabinovich about "'Green Pharmacy' of the Tropics"]

> [Text] Recently, a scientific conference convened in Ho Chi Minh City (SRV [Socialist Republic of Vietnam]), which dealt with problems of tropical medicine, as well as investigation of tropical medicinal plants and development of drugs with them. It was attended by scientists and specialists from Hungary, Vietnam, GDR and the Soviet Union. The editorial staff asked one of the participants, A. M. Rabinovich, doctor of pharmaceutical sciences, chief of 'Botanical Garden' Laboratory at the All-Union Scientific Research Institute of Medicinal Plants (VILR), to talk about the results of this conference.

[Question] Aleksandr Moiseyevich, you delivered a paper at the conference in Ho Chi Minh City on "Use of Tropical and Subtropical Medicinal Plants in the USSR." Tell us, please, why is there such great interest in expressly these plants at the present time?

[Answer] It is by no means by chance. Of all the extensive flora of our country, about 2500 plant species have medicinal value. More than 600 of them can be used as raw materials for the pharmaceutical industry. In the USSR, much attention is devoted to the study of medicinal plants. The staff of botanists, pharmacologists, chemists and agronomists of VILR have been working on this project for more than 50 years. Both wild and cultivated species are being investigated. We have learned to raise on an industrial scale such valuable heat-loving plants as Aloe arborescens Mill., Java tea [Orthosiphon stamineus], Chalanchoe, three species of eucalyptus, large-flower magnolia, plane-leaved bottle tree [Sterculiaceae], pink Catharanus, lobate nightshade and other species that grow in tropical zones of Asia, Africa and Australia. All of these plants are valuable raw materials for production of numerous agents used for treatment of dozens of different diseases. Tropical flora is indeed a treasury of health!

The biological activity of tropical plants is immeasurably greater than in other representatives of medicinal flora. However, because of the climate

conditions in our country, they are being cultivated on small areas. Vietnam is another matter. While 21,000 species of flora grow on our vast territory, there are 12,000 on the considerably smaller territory of SRV. This is an enormous gene pool.

[Question] Could you tell us how investigation and use of medicinal plants are set up in Vietnam?

[Answer] The SRV began to collaborate within the framework of the Permanent Commission for Health of CEMA in 1978. There are 15 scientific research and therapeutic-preventive institutions of Vietnam participating in implementation of several integrated programs related to workers' health care.

The Central Institute of Medicinal Plants of this republic's Ministry of Health was established in Hanoi, and its staff investigates the medicinal flora of the tropics and is working on development of new phytopreparations. There is a branch of this scientific institution in Ho Chi Minh City. It is headed by Prof Doan Tkhi Nyu who is known for her research in pharmacology. For many years, our institute has maintained close creative contact with the Central Institute of Medicinal Plants. About 50 Vietnamese chemists, pharmacologists, pharmacognosticians and agronomists have undergone training in our country at the VILR. Nguen Van Dan, first deputy minister of health of Vietnam is studying such a valuable medicinal plant as Dioscorea. The name of the elder of Vietnamese pharmaceutics, Prof Do Tat Loy, who has authored a monograph on Vietnamese medicinal plants, is known all over the world.

There are pharmaceutical enterprises in Vietnam that process medicinal raw materials. There is a center in each province where treatment is administered using traditional drugs and, first of all, agents of plant origin. Many villages have their own "pharmaceutical gardens."

[Question] What are the basic problems in the area of investigation of tropical medicinal plants that were discussed at the conference?

[Answer] Vietnamese specialists delivered dozens of papers. Of special interest is the research being done in the southern part of this country, where ginseng grows in the mountain jungles. Its roots contain the same quality of biologically active substances as our Far East and Korean ginseng, but the quantity is different. At the Center for Investigation of Vietnamese Ginseng under the Vietnamese Ministry of Health in Ho Chi Minh City, which is headed by the prominent scientist, Nguen Tkho Nkhan, studies are being made of the therapeutic properties of this valuable plant. Vietnamese ginseng stimulates the function of the heart, raises blood pressure, has anti-inflammation and analgesic action.

Under the new Five-Year Plan, Vietnam will be helped to develop industrial plantations of highly productive cultivars of mint, Dioscorea, Rauwolfia, Stephania, as well as a remarkable ether-bearing plant, melluleuca. This plant belongs to the Myrtus family, like eucalyptus. Wild-growing thickets occupy thousands of hectares of swamped land in Vietnamese jungles, where nothing else grows. The Vietnamese Ministry of Health has singled out 2000 ha of wild-growing melluleuca thickets in Long An Province 40 km from Ho Chi

Minh City, for investigation of the conditions for growing this valuable medicinal plant and recovery from it of the well-known "kaeputovoye" oil, which is used by the Vietnamese for colds, cough, bronchitis and otitis media.

[Question] What are the main results of the conference?

[Answer] Specific suggestions were written up on the problem of "Medicinal Raw Materials," which are included in the program of collaboration of CEMA member nations within the limits of the general agreement on cooperation and acceleration of development of science and technology of the Socialist Republic of Vietnam up to 1990. The collaboration plan includes several topics, including "Investigation of Ethereal Oil Bearing Plants of SRV," "Development of Technology for Production of Steroid-Containing Species of the Genus Dioscorea in SRV," which is valuable raw material used to produce agents for treatment of many serious diseases.

It is planned to establish a solid raw materials base in Vietnam for CEMA member nations referable to many species of tropical medicinal plants. The scientists of socialist countries, including the Soviet Union, will offer their Vietnamese colleagues the broadest cooperation in developing the "green pharmacy" of the tropics.

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UDC 613.6-07:613.8-057

METHODS OF STUDYING NERVOUS SYSTEM IN RECENT PATENTS

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 12, Dec 84 (manuscript received 12 May 83) pp 59-62

ANTONOVA, K. P. and CHELOMBIT'KO, T. I., Institute of Labor Hygiene and Occupational Diseases, Khar'kov

[Abstract] A study is reported of the state of development of methods of studying the nervous system based on patents granted in recent years, primarily in the USSR and USA. Particular interest is given to the qualitative and quantitative dynamics of issuing of patents in the area. The analysis showed that the greatest number of publications on methods of investigation of the nervous system were found in the patents of the USSR and the USA. The number of applications filed in 1971-1972 increased. The number of publications on the subject has increased in the USSR over the past three years, increased in the USA in 1974 and 1979-1980, in West Germany in 1977-1978. Methods of studying the status of the physiological functions are the subject of 50% of the patents, determination of biopotentials and evoked signals and other problems of electroencephelography represent 17%, the diagnosis of diseases and trauma 33%. Some 58% of the methods of investigation and evaluation of the status of physiological functions have been dedicated to evaluating the overall status of the nervous system, 29% to the study of individual analyzers. The best developments have been those which allow functions to be expressed in digital form and compared with a standard, as well as those which allow studies to be performed with portable apparatus. References 42: 16 Russian, 26 Western. [1743-6508]

UDC 579:541.6

RESISTANCE OF POLYMERIC REAGENTS USED IN DRILLING FLUIDS TO SOIL MICROORGANISMS

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 46, No 6, Nov-Dec 84 (manuscript received 25 Apr 83) pp 10-14

SHTEYNBERG, B. I., TRAKHTENBERG, S. I., DATSYUK, N. M., KOROSTYLEVA, R. N. and GURA, I. S., Lvov State University; Lvov Polytechnic Institute

[Abstract] An evaluation was conducted on the polymeric agents used in drilling fluids to determine their stability vis-a-vis soil microorganisms to which they are exposed in use. For the study two groups of polymeric agents were selected, one consisting of humates, peptides (from collagen) and acrylonitrile in ratios of 1:1, 77:3, and 1:2:3. The other group of products consisted of copolymers formed from peptide humates and methyl acylate in ratios of 1:0 and 5:3. The data showed that the acrylate and methyl acrylate copolymers with humic substances pretreated with collagen peptides were resistant to biodegradation by soil microorganisms for at least one year at 20-30°C. In addition, the preparations possessed bactericidal and fungicidal properties, resulting in complete sterility of contaminated drilling liquids in 30 days. Figures 2; references 5: 3 Russian, 2 Western.
[1826-12172]

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